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CONTENTS AND DIGEST

Graduate Instruction in Surgery. George P. Muller, M.D., Philadelphia.....503

A plea for proper organization as a duty of the medical schools of the universities, suggesting that affiliation be sought with high class hospitals. Question of research. Work of the Committee on Postgraduate Instruction in Surgery.

The Sanatorium Care of Tuberculous Soldiers by the Federal Government. George Thomas Palmer, M.D., Springfield, Ill., and Henry W. Hoagland, M.D., La Jolla, Calif.....506

The need for institutional discipline and the building up of medical and nursing personnel.

Puerperal Mastitis. Franklin A. Dorman, M.D., and James K. Mossman, M.B. (Tor.), New York.....509

Acute infection in the nursing breast during the early weeks postpartum.

Discussed by Drs. Swain and Dorman.

Cooperation Between a Central State Laboratory and Local Municipal and County Laboratories. Augustus B. Wadsworth, M.D., Albany, N. Y..512

Problems of standardization. Training of workers. Government. Equipment.

Measures for Increasing the Supply of Competent Health Officers. John A. Ferrell, Dr.P.H., New York.....513

A consideration of the factors of salaries, provision for training, education of the public and establishment of fellowships. Number of officers needed to take care of increasing demands.

Discussed by Drs. Rosenau, Edsall, Watkins and Ferrell.

Retropharyngeal Abscess. Ira Frank, M.D., Chicago 517

Historical review. Frequency. Pathologic anatomy. Diagnosis. Treatment.

Discussed by Drs. Sonnenschein, Welty, Lyman, Pratt, Myers, Beck, Chamberlain and Frank.

Fundamental Factors in the Control of Tuberculosis, with Especial Reference to the Sanatorium. Henry Boswell, M.D., Sanatorium, Miss.....523

The sanatorium presented as an educational source, reaching all communities through the tuberculous population.

Discussed by Drs. Love, Otis, Wood and Boswell.

CLINICAL NOTES, SUGGESTIONS AND NEW INSTRUMENTS

Case of Massive Tuberculous Kidney. S. W. Sappington, M.D., Philadelphia 525

(Continued on next page)

MEDICAL EDUCATION IN THE UNITED STATES 527

Presentation of educational data for 1921 by the Council on Medical Education and Hospitals. Statistics of colleges. Home states of medical students. Numbers of medical students and graduates. Graduates holding degrees in arts. Women in medicine. Number of colleges. Length of terms. Tuition and other fees. Colleges, students and graduates by states. Qualifications of students and graduates. Hints to prospective medical students. Graduate medical education. College notes. Graduate courses in public health. Graduate courses in medical schools. Graduate medical schools. Choice of a medical school. Standards of the Council classification and description of medical colleges. The Association of American Medical Colleges.

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Bulletin

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CONTINUED ON PAGE 3

CONTENTS AND DIGEST— Concluded

Smoking in Pulmonary Tuberculosis. E. A. Duncan, M.D., El Paso, Texas 526

A Case of Chronic Acetanilidism. John W. Shuman, M.D., Sioux City, Iowa 526

EDITORIALS

Medical Education—Progress of Twenty-One Years 557
Measures which have resulted in reorganization in this country.

Medical Support for the Antivivisectionists 559
Addresses made by possessor of a medical degree.

The Pellagra Problem 560
Effectiveness of appropriate dietary measures.

CURRENT COMMENT

Requirements for Admission to Medical Schools 561
The custom in this country and abroad.

Vitamins: Their Distribution 561
Adequacy of the common dietary.

Information for Prospective Medical Students 561
Assistance in choosing a school of proper standing.

Rest Periods and Physical Efficiency.562
Advantage of interrupting heavy work at short intervals.

MEDICAL NEWS

CALIFORNIA: Hospital for Colored Patients—Appointments for Leland Stanford Medical School—Food Research Institute.....562

COLORADO: Personal 562

DISTRICT OF COLUMBIA: Personal—Legislation to Sell Old Naval Hospital.....563

GEORGIA: Personal 563

ILLINOIS: Chicago: Hospital News — Health Exhibits at Pageant of Progress.....563

INDIANA: Physician's License Revoked....563

MARYLAND: Personal—Report of Health Board 563

MASSACHUSETTS: Physician Stabbed by Patient —Addition to Tufts Faculty—Personal..563

MICHIGAN: Industrial Adjustment Center..563

NEW JERSEY: Personal.....563

NEW YORK: New York City: Personal—Resolution Relative to Habit-Forming Drugs..563

PENNSYLVANIA: Hospital News—Lehigh Valley Medical Association—Dr. Baldy Named to Welfare Post. Philadelphia: Personal—Gifts for Phipps Institute.....563

SOUTH DAKOTA: Sioux Valley Medical Meeting 564

TENNESSEE: Cheerfield Farm.....564

TEXAS: Health Appropriation Cut.....564

CANADA: Personal—United States Doctors at Summer Association Meeting in New Ontario 564

GENERAL: Reunion of Medical Officers — National Association of Federal Medical Officers —Warning—Sweet Bill to President Harding —Senate Committee to Investigate Hospitals —Conference on Pellagra.....564

LATIN AMERICA: Personal—The Exodus from Colombia to Panama.....565

FOREIGN: Next International Congress of Urology to Be Held at Rome—Shanghai Medical Society — Council on Pharmacy and Chemistry for Italy—Appropriation Asked for Further Research on Friedmann's Remedy—Deaths in Other Countries.....565

GOVERNMENT SERVICES 565

FOREIGN LETTERS 566
London—Paris—Mexico City.

MARRIAGES 568

DEATHS 568

CORRESPONDENCE 569
Chiropractic in Ohio—Opportunities for Graduate Medical Education in Europe—Changes in Educational Methods and Legislation Advocated.

QUERIES AND MINOR NOTES 570
Auto-Urine Test for Tuberculosis; Intradermal Injection of Urine—Vitamins and Their Distribution.

MEDICAL EDUCATION, REGISTRATION AND HOSPITAL SERVICE 571
Coming Examinations — Massachusetts March Examination — Ohio April Examination — Delaware June Examination.

BOOK NOTICES 572

MEDICOLEGAL 572
Town Without Authority to Operate Ambulance and Not Liable for Injuries.

SOCIETY PROCEEDINGS 572
Coming Meetings.

CURRENT MEDICAL LITERATURE

American Medical Journals

Spontaneous and Subcutaneous Spleen Ruptures — Spontaneous Rupture of Malarial Spleen—Surgery of Cysts of Spleen—Surgery of Infantile Paralysis — Skull Fracture in Children—Surgical Solution of Chlorinated Soda Ineffectual in Empyema — Case of Uretero-Ureteral Anastomosis—Diverticula of Jejunum—Treatment of Pernicious Anemia 573

Case of Amebic Abscess of Liver—Theories of Blood Coagulation — Statistics on Epidemic Encephalitis—Gram Reaction—Capacity for Phagocytosis in Dead Animals—Relative Digestibility of Various Proteins.....574

Pigmentation and Fat-Soluble Vitamin of Peas —Effect of Hydrochloric Acid Ingestion on Urine—Blood Content of Calcium and Phosphoric Acid in Normal Child—Experimental Rickets in Rats—Respiration and Blood Alkali in Carbon Monoxid Asphyxia — Electrical Treatment of Foot Musculature—Hypertrophic Arthritis Not Due to Static Strain—Case of Ureteral Myiasis—Schick Reaction in Control of Diphtheria.....575

Foreign Medical Journals

New Method of Estimating Morphologic Changes in Heart—Treatment of Exophthalmic Goiter —Removal of Pus in Knee-Joint—Malignant Granuloma of Nose — Vaccine Therapy of Asthma 576

Improvement on Cesarean Section—Causes of Mortality of Premature Infants—New Method of Exposing Clavicular Regions—Acute Pancreatitis Followed by Pancreatic Cyst....577

Curable Form of Ataxia in Tabes—Paraffined Starch in Treatment of Diarrhea—Gummatous Tumors in Calf—Syphilitic Melanodermia—Sarcoma of Kidney in Infant—Syphilitic Myositis—Septicemia Arrested by Vaccine—Treatment of Pneumonia—The Adjuvant Causes of Malaria—Index for Infant Feeding—Pulsating Empyema—Wave of Intense Uremia 578

Prophylaxis of Shock on Injection of Arsphenamin—Tuberculous Edematous Infiltration of Lung—Pregnancy Pyelonephritis — Anemia with Gastric Cancer—End Results of Surgical Treatment of Gastric and Duodenal Ulcers—Perforation of Lung During Artificial Pneumothorax—Repair of Wounds of Cartilage in Joints—High Frequency Current in Treatment of Bladder and Urethra Tumors—Partial Resection of the Kidney.....579

Drumstick Fingers from Freezing—The Radius Extensor Reflex—Lesions of the Optic Thalamus—Polycystic Kidney — Nystagmus in Anaphylaxis — Mechanical Treatment of Pseudarthrosis of the Humerus—Autoplasty of the Skull—Hypernephroma — Direct Suspension Laryngoscopy—Treatment of Fistulas by Inversion of Skin—The Anamnesis—Intravenous Treatment of Syphilis—Problems of Congenital Syphilis 580

Hospital Contagion with Tuberculosis—Metabolic Findings in Infants on Butter-Flour Mixture and Cream-Milk—Creatin Output in Infants—Famine Edema and Intestinal Tuberculosis—Modification of the Skin Tuberculin Test—Abdominal Pain in Children—Occult Bleeding in Diagnosis of Gastric Ulcer—Transverse Section Anesthesia — Thrombosis of Abdominal Aorta—Mechanism of Inheritance of Sex—Status Thymicolymphaticus.581

Further Extension of the Principle of the Billroth I Method in Resection of the Stomach—Daily Variations of Arterial Tension in High Blood Pressure—Blunders in Treatment of the Eyes—Temporary Sterilization — Radiotherapy in Polycythemia with Enlargement of the Spleen 582

TONICS AND SEDATIVES—BOOKS RECEIVED.....Adv. Page 20

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GRADUATE INSTRUCTION IN SURGERY *

GEORGE P. MULLER, M.D.

PHILADELPHIA

You no doubt have observed that the social unrest and desire for change prevalent today has affected even medicine, and not only here but also in England and on the continent. Teachers and students (in the broad sense) are dissatisfied with present conditions and are seeking a remedy. Much of this concerns the undergraduate schools and will not be discussed, except to point out that the present tendency among those interested in the pedagogic aspect of medical education is to lighten the undergraduate curriculum at both ends. The ancillary sciences do not trespass so much on the earlier years of the medical student in this country as they do in England. But at the other end, we have developed the specialties to such an extent as severely to tax the capabilities of the student.

The aim of the medical school, including the fifth or hospital year, should be devoted primarily to producing well-trained practitioners of medicine—the so-called "family doctor"—because at least three fourths of the recent graduates will settle into such practice and be entitled, by right of the state or national examining boards, to do whatever their conscience or the confidence of their patients allows them to do. In spite of the recent growth of what is known as "group practice," the present generation at least will not see the extinction of this class. They should, on graduation, be well trained in the diagnosis and treatment of the common ills of mankind, skilled in preventive medicine and hygiene, and so taught in the methods of research that the obscure cases in their practice are studied out and finally diagnosed. In this they will often need the help of this or that specialist; but if they have the proper training and the wisdom to keep abreast of progress, the general practitioner will remain the "captain of the ship."

Most physicians are content with the path they elect to tread, but some, impressed by the ever-increasing extent of medical art and science and discouraged by the attempt to master the whole of it, narrow their field and "specialize" in a part of the whole. Environment, opportunity, natural inclination and other factors enter into this choice of effort. I need not dwell on the lure of larger incomes believed to be enjoyed by the "specialist." The net income is not as large as generally supposed, and those who are most successful in this direction are men of distinction and ability, capable of incessant work, qualities which would place them in the forefront of any profession or industry other than medicine. But the fact remains that the machinery of medical service to the public demands the development of those who are expert in various fields.

We are here concerned only with general surgery and the training of the surgeon. Much literature has appeared on this subject, and some here may remember that in 1905 Dr. Richardson spoke on it in his chairman's address before this section. Organized effort, particularly by the American College of Surgeons, has been directed to the attempt to uplift the specialty of surgery. You may also remember that in 1917, after Dr. Bevan read his paper on "The Problem of Unnecessary Operations," this section appointed a committee of ten of our most distinguished Fellows to report at a subsequent meeting. But again I must narrow the field and bring myself to the subject of this address. It is based on the problem as to how the surgeon of the future should be developed and the opportunities which should be given those who wish so to qualify in the practice of surgery that the confidence of the public will not be misplaced.

DEVELOPMENT OF THE GRADUATE MEDICAL SCHOOL

The limitations of time and space do not allow of any extended discussion on the development of postgraduate instruction by regularly organized bodies. "The postgraduate school was established to do what the medical school had failed to accomplish. At first the instruction was necessarily at once elementary and practical. There was no time to go back to fundamentals; it was too late to raise the question of preliminary educational competency. Urgency required that in the shortest possible time the young physician already involved in responsibility should acquire the practical technic which the medical school had failed to impart. The courses were made short, frequently covering less than a month; and they aimed preeminently to teach the young doctor what to 'do' in the various emergencies of general practice." [1]

The efforts of the American Medical Association through its Council on Education were gradually rewarded by a raising of the general level of medical education. The postgraduate schools adapted themselves to the changed conditions and offered special courses "adapted to the needs of those inclined to devote themselves more or less exclusively to some particular line of work" (Carnegie report). The courses on the "eye, ear, nose and throat" made notable progress, and the better class of schools, of which there were only four or five, offered excellent opportunities.

* Chairman's address, read before the Section on Surgery, General and Abdominal, at the Seventy-Second Annual Session of the American Medical Association, Boston, June, 1921.

1. Carnegie Report on Medical Education, 1910, p. 174.

But in the much broader field of general surgery no progress at all was made. The student did some dissecting, witnessed operations, occasionally assisted at operations, attended lectures and so on, but there was no systematic organization or thorough discipline. Clifford Allbutt well says, "Hitherto this kind of teaching has been by a selection of side shows, not organized about the central schools."

Bevan stated, two years ago, that postgraduate instruction in this country is about on a par with what undergraduate instruction was fifteen years ago, when the American Medical Association undertook the work of elevating the standards of education in our medical schools. In other words, it does not exist—it must be created.

The idea has gradually forced itself on us that the proper place for a graduate school of medicine is under the aegis of a university. In 1917, the clinic at Rochester, Minn., recognizing this fact, merged its foundation with the University of Minnesota, and became an integral part of that institution. The graduate school of medicine needs abundant resources, the highest type of teachers, opportunities for research and original investigations and, above all, the proper standards and traditions inseparable from a great university. Hence you will note that Minnesota, Harvard, Pennsylvania, California, Tulane, Chicago, Washington and others are seriously undertaking the difficult task of so organizing their schools of medicine as to include separate or partly combined schools of graduate medicine. Bevan stands squarely when he says: "The problem of inducting a medical school into a university is a difficult one, because medicine is more than a science. If it were simply a science it would be a simple matter to introduce it into a university and handle it without difficulty, just as the science of physics is handled; but it is an art, and it is a professsion by which men make their livelihood." Some of these problems have been well worked out by Lyon.[2]

REPORT OF THE COMMITTEE ON POSTGRADUATE INSTRUCTION IN SURGERY

A further impetus to the development of the field of graduate medical teaching has been given by the attention paid to this subject during 1920 and 1921 by the Council on Medical Education and Hospitals of the American Medical Association. This year a committee headed by Drs. Frazier and Lewis, both former chairmen of this section, held meetings and formulated a report,[3] published in THE JOURNAL last March. I will refer to this again. If our Association exerts the same powerful influence for graduate teaching as it did in the matter of the undergraduate schools, we can look forward with high hope to the future.

The proper organization of graduate instruction in surgery is a difficult matter. I have pointed out the reason why such instruction should be developed as part of the duty of the medical schools of the universities. All who have studied this matter are agreed that, except to a very limited extent, the work of the graduate student must be approached from a very different angle from that of the undergraduate. Makins says:

> The most successful teachers of undergraduates, probably by reason of the dogmatic nature of the instruction given, and the necessary limitations of its scope, are by no means necessarily those who can interest and enthuse the graduate, as any one who has passed his life in a medical school is well able to appreciate. Many teachers who are able to enforce broad general principles founded upon practical experience may lack the necessary knowledge of literature and acquaintance with the most recent methods of scientific research needed by the graduate; yet, literary erudition and extensive acquaintance with the most recent methods and results of research, while not essentials for a teacher whose task is to produce an efficient practicing "doctor," are necessary qualifications for the leadership of the graduate who aspires to follow the higher paths of medicine.

I am not intending to suggest that the higher qualifications are not necessary for the undergraduate teachers, but the best of these concern themselves with fundamentals. Again to quote Makins:

> The atmosphere of a primary (undergraduate) medical school, where the main object is to impart elementary and practical instruction, is unsuitable to the acquirement of intimate acquaintance with detail, and in a considerable degree to the freedom of thought, the skeptical attitude toward received and adopted views, and the single-minded desire to advance medical science by research which should animate the graduate who seeks to follow the higher paths of medicine.

The organization of the work in the medical sciences, the provision for research, the library, etc., are comparatively easy matters if the financial resources are sufficient. But, except in the unusual Mayo clinic, I know of no place where the clinical material is large enough to furnish a sufficiently large turnover for the proper study of clinical surgery by a large graduate school. It can be done if the students are limited to very small numbers, but the cost per student in this event becomes almost prohibitive. For this and other reasons the university should seek affiliation with a number of high class local hospitals whose equipment, standards and staff correspond with the desiratum. There is but one difference between such an arrangement and the Mayo Clinic with its several hospitals, and that is the lack of control over the teaching in these places. This is not serious, however, and can be bridged over if mutual good will and a bond of sympathetic understanding exist.

We need not continue our clinical teaching to the immediate local environment. As Lyon says:

> Every ethical private clinic in the country—every clinic large enough to afford advanced training for even one young medical graduate—should be affiliated with some university which should have the power to supervise that man's graduate training and in the end should attest, after proper examinations, his technical proficiency. . . . The leading specialists must be urged and taught to make their clinics more than places of business. . . . The undoubted reflex effect of a university connection should appeal to competent specialists and make the task of securing their cooperation easy. As the state-wide campus has become the watchword of agricultural colleges and state universities, so the nation-wide clinic should be the ideal in the training of medical specialists.

But even though there is enthusiastic cooperation between the university and the affiliated hospitals, we must acknowledge the necessity of the central hospital with the various units organized under university control. It emphasizes the university ideal to every student—the spirit of research—whether that student be a full graduate student or simply passing through certain courses of study (the so-called postgraduate student). It enables group study of surgical disease under experimental conditions, like the work on empyema at the

2. Lyon, E. P.: Graduate Education in the Clinical Branches, and the Minnesota Experiment, J. A. M. A. **69**: 1307 (Oct. 20) 1917.

3. Frazier, C. H., and Lewis, Dean: Report of the Committee on Postgraduate Instruction in Surgery, J. A. M. A. **76**: 732 (March 12) 1921.

Rockefeller Institute during the war, and, above all, enables the central faculty to teach minutely by reason of the fact that the graduate student furnishes the personnel of the hospital. He is clerk, assistant, surgical resident, assistant surgeon and research worker at different times.

At Pennsylvania we have started under ideal conditions. We have the university, a central hospital for graduate teaching exclusively, and a group of affiliated hospitals, at present eight in number. At least two private clinics in the state will probably be available.

Is there any need of graduate teaching in surgery? This question is easily answered for the shorter courses for general practitioners. Well-balanced instruction in the diagnosis and treatment of malignant disease, fractures and dislocations, wounds and the newer methods of wound treatment, the diagnosis of acute abdominal emergencies, etc., cannot fail to be instructive and extraordinarily valuable to the community. There are also surgeons in small cities who find it difficult to keep in touch with technical progress except by reading. A few months spent in the clinics of the large cities and certain special courses, such as cystoscopy, brain or chest surgery, wound treatment, etc., are of infinite value.

The English speak of these as "refresher courses," and they prove refreshing to the spirit as well as to the mind. I always feel spurred to new endeavor by my attendance at the meetings of the Clinical Surgical and Interurban Surgical societies each year, even though sometimes nothing new in technic is learned. Contact with other surgeons in a different field is always stimulating.

The Committee on Postgraduate Instruction in Surgery concluded that provision must be made for two separate and distinct groups. First, those who, on graduation in medicine, may wish to pursue a course which, on its completion, will prepare them for the practice of surgery and lead to a degree; and, second, those who have been engaged in the practice of general medicine for a number of years and wish to prepare for the practice of surgery; or, having practiced surgery, are desirous of perfecting themselves in the more recent developments in diagnosis and practice.

The first is the ideal type for the graduate school, and the one to which, I think, Minnesota and Rochester confine their efforts. Those of us who practice in the large cities and particularly in medical school centers are familiar with the type of recent graduate, finished with his hospital internship and determined to be a surgeon. He works in the outpatient clinic, one or more laboratories and dissecting room, and especially if earnest and hard working, soon attains the position of assistant surgeon to a surgical service. He does a certain amount of clinical research, acquires the art of surgery, and in many cases succeeds to a major position on the hospital staff. He is spurred to endeavor by the knowledge that there will be keen competition for the post he desires. To all intents and purposes he is a graduate student, but he would benefit markedly if he was not only under the guidance of his clinical chief but also placed himself under the organized direction of the graduate school in order to prevent the clinical part of his career from becoming top heavy.

Some of these men leave the medical school center and radiate in different directions, sometimes in another city and sometimes in the towns, wherever opportunity beckons. Too often, however, the ambitious student of surgery is held down by lack of opportunity for advancement in the institution in which he begins work. The director of the course in the graduate school should become familiar with vacancies and with opportunities and endeavor to place these men before they become discouraged.

A different problem is presented by the second group of the committee, namely, those who have been engaged in the practice of general medicine for a number of years and wish to prepare for the practice of surgery; or, having practiced surgery, are desirous of perfecting themselves in the more recent developments in diagnosis and practice. At present I believe that practically all of this group should start in a well-planned course of eight months' duration termed the "instructional year," with the time about equally divided between the clinical and scientific (ancillary) branches. At Pennsylvania we began with a definite time schedule, but I realize that graduate work can be done only to a limited extent in classes. We reduce the school to the dead level of mediocrity by so doing. No two men have exactly the same capabilities, the same ambitions, the same opportunities. Their problem must be met individually.

By personal contact and reports from the instructors, the director can soon learn the capabilities of the individual, and by a sorting process meet each requirement even to the point of discouraging further attendance in the school. The instruction in anatomy, pathology, physiology and biochemistry is rigid at first, but becomes flexible in time, and finally so loose as to allow the student full play in the cultivation of initiative in surgical research. By the end of the year the better type of men will be on a par with those referred to as Group 1 and become eligible as candidates for the degree. The others will, at least, have spent a profitable year.

I cannot outline in a few words the details of the three or more years proposed for the course in surgery. The student becomes part of the machinery of the school; he is not regarded as a "student" but as a fellow. He may be an assistant, a resident surgeon, the chief of the outpatient department; he may teach his juniors, share responsibilities with his seniors. He will be judged by his thoroughness and attention to detail more than anything else. He must "catch the scientific idea" as well as develop technical proficiency. His work must be organized; otherwise it might be so unsystematic as to be incomplete; but individual initiative must be encouraged. He "must be held back from clinical plethora, from engorgement with routine observation, diagnosis and care of the sick. He must be given time for laboratory and library work; for meditation and expansion; for the development of originality and the evidence thereof—his doctorial thesis" (Lyon).

CAREER OF THE PH.D.

What, then, when the university has set the final seal of approval on the finished product and conferred the Ph.D.? I have no fear for the future. The pioneer work may be somewhat disappointing, but the time is near when the demand for trained men in surgery will force the hospitals to recognize their superior value to the institution, and to the patients, over those who have simply marked time and have nothing but faithful years of service to their credit. But few of the smaller cities or towns, in my vicinity at least, offi-

cer their hospitals with full-time surgeons. Mostly, they are served by general practitioners who do a very limited amount of surgery and lack experience in modern methods. Public opinion in future years will want something better done for its surgical ills and the appointments made from applicants trained in their specialty irrespective of their local affiliation.

The graduate school must, however, be in a position to finance or partly finance its students by a system of stipends; otherwise the years of instruction and study become too costly except for the well-to-do.

I do not believe that the graduate school of medicine should limit its efforts to the picked candidates except for certain essential entrance requirements. He should be the mainstay of the school. But there should always be proper provision for every sort of instruction demanded, provided it is modern, scientific and imbued with the high standards and ideals of university training. Not only must we be able to train practitioners in specialities, but we must include facilities for those who want to do pure research, for those who will be the future teachers or professors, often on a full-time basis.

Arnold well says:

> The extent to which the graduate school may carry its advanced instruction is limited only by its equipment and the ability of its teachers. Even the most experienced physicians and the most highly trained scientists may profit by such opportunities, for no one has mastered so much of medical knowledge that there are not many others capable of teaching him many useful things.

1930 Spruce Street.

THE SANATORIUM CARE OF TUBERCULOUS SOLDIERS BY THE FEDERAL GOVERNMENT

GEORGE THOMAS PALMER, M.D.
SPRINGFIELD, ILL.
AND
HENRY W. HOAGLAND, M.D.
LA JOLLA, CALIF.

Early in the World War, there were brought to us from overseas reports of the prevalence of tuberculosis in the military forces and in the civil population which caused the tuberculosis war problem to assume staggering proportions. These first reports were doubtless exaggerated. At any rate, they were sufficiently inaccurate to cause the pendulum of medical opinion to swing backward in its characteristic fashion, and there were found those who minimized the importance of tuberculosis in its connection with the war until it apparently ceased to be a problem of any considerable magnitude. In fact, some of the articles published at that time gave one the impression that military service would prove beneficial rather than hurtful to the man with dormant tuberculosis.

Be that as it may, we find ourselves at the present time possessed of sufficient evidence to justify the conclusion that after all others, save one, of the medical problems of the war have been satisfactorily settled, tuberculosis will remain the paramount problem of the government whose solution will not be reached for two decades at least. The other problem will be that of the proper care of nervous and mental cases.

The incidence of tuberculosis as the result of the war cannot as yet be determined. It is certain, however, that the maximum has not been attained, and it is asserted by those who have given the subject serious consideration that the peak will not be reached for a number of years to come.

The war-time tuberculosis problem of the United States may not be the staggering thing at one time anticipitated. It has been sufficiently big, however, for the nation to be proved incapable of meeting the situation. Neither in hospitals, sanatoriums, nursing service nor competent medical personnel were we prepared for the great increase in recognized tuberculosis among our soldiers, sailors, marines and nurses, and, if the truth be known, we are not yet prepared to meet our war-time emergencies. Possibly it would have been better for us had we remained gravely concerned as we were by the first exaggerated reports from overseas. It is quite likely that the conservatism or optimism causing the backward swing of the pendulum has been partly responsible for our lack of preparation and has cost many human lives.

Before we were fairly engaged in the war, scores of young men, unfortunately passed in the selective draft, although definitely tuberculous, were coming back to their home communities, in many states to find inadequate sanatorium provision and, in not infrequent instances, to die in almshouses. Before any other agencies were functioning, be it said to its credit, the National Tuberculosis Association had assumed its war-time responsibility of caring for these unfortunates and, in many of the states, the state and local tuberculosis associations secured the means for institutional care and relief which otherwise would have been unprovided.

Until the signing of the armistice, the policy generally prevailed of retaining the tuberculous individual in service and caring for him in army and navy hospitals; but after the signing of the armistice and with the outside influence brought to bear to obtain the discharge of patients regardless of their physical condition and welfare, it became evident that this policy must be abandoned. From that time until the present, with promise of perpetuation into the future, political and other outside influences have been the greatest obstacle to the federal government in doing its full duty to its sick men.

HOSPITALIZATION AND CARE OF RETURNED SOLDIERS

With the wholesale discharge of tuberculous persons from military service and from army and naval hospitals, it became necessary to develop an enormous machinery including hospitals, sanatoriums, dispensaries and medical service to care for returned soldiers on their voluntary application for such care.

Somewhat more than two years ago, this gigantic task was imposed upon the United States Public Health Service. The Public Health Service is accustomed to emergencies, but this was one for which it was quite unprepared both in institutions and in technical personnel. The old marine hospitals had been permitted to fall into a condition of comparative disuse, and some of them had been abandoned. The temporary military hospitals, turned over to the service, were for the most part unsuited for the proper care of tuberculous persons. In many instances, when these institutions were taken over, it was found that the equipment

was hopelessly inadequate and, for a time, supplies and new equipment were seriously delayed or were quite unobtainable.

Regardless of the character of government-owned institutions, their bed capacity was entirely insufficient and it became necessary for the Public Health Service to enter into contracts or agreements with existing private and public sanatoriums for the care of tuberculous persons. This contract service has given rise to a great deal of controversy and discussion. After a rather careful study of the facts, we believe we may say that the average service rendered by contract hospitals has been reasonably satisfactory. The shortage of beds throughout the nation made careful discrimination in the selection of institutions impossible. Many of the private sanatoriums of the higher class have accepted government patients at considerable sacrifice, in money as well as in institutional morale, cheerfully made in a patriotic spirit, and it is certain that these institutions have given better service than can ever be expected from the large government-owned sanatoriums.

It was necessary, however, to utilize beds in some private institutions whose standards are not so high, and it was unfortunately also necessary to place patients in institutions designed for the care of paupers and destitute persons. Regardless of the character of service afforded by these institutions, the stigma of the so-called "charity institution" made it impossible for them to be in any way acceptable.

INSPECTION OF SANATORIUMS

In undertaking its great task of the hospitalization and care of returned soldiers, the Public Health Service apparently fully recognized its unpreparedness and further recognized that the tuberculosis problem would be, perhaps, the most difficult it would have to encounter. The Surgeon General and an efficient chief of the Tuberculosis Section, with unusual breadth of vision, were not only receptive of constructive criticism, but unhesitatingly sought what they regarded as authoritative guidance. As a result of numerous conferences with a special committee of the National Tuberculosis Association, five physicians were selected to visit and inspect the existing government sanatoriums and to recommend changes and corrections contemplated to bring about better methods of diagnosis, care and treatment. We were selected in this group, together with Dr. David R. Lyman of Connecticut, and Drs. Victor F. Cullen and Martin F. Sloan of Maryland. To Dr. Lyman, Dr. Cullen and Dr. Sloan were assigned the tuberculosis sanatoriums and the tuberculosis divisions of general hospitals throughout the eastern and southeastern sections of the country, while we were asked to make studies of the hospitals at Fort Bayard and Fort Stanton, N. M.; Prescott, Ariz.; Palo Alto and Camp Kearney, Calif.; Tacoma, Wash.; Houston, Texas; Alexandria, La.; Evansville, Ind., and St. Louis.

While it cannot be denied that there were many conditions found in these institutions subject to criticism, we ourselves returned from our inspections with our chief impression one of admiration for the efficient manner in which the Public Health Service had met its tremendous obligation in the face of many serious difficulties, and we are satisfied that this impression is shared by the other members of the inspection committee and must likewise be entertained by any fair minded person whose opinion is based on actual knowledge of facts rather than on sensational rumors and irresponsible misstatements.

The members of the committee were asked to remain in each institution long enough to become acquainted with the members of the medical and nursing personnel; to familiarize themselves with the methods employed in diagnosis and treatment, and to obtain definite knowledge as to discipline, food, amusements and diversions of the patients and the application of special diagnostic and therapeutic procedures. They were asked to direct their attention particularly to institutional operation and management, devoting themselves to buildings and physical equipment only so far as these might affect the medical service and the care and welfare of patients. Physical property is frequently inspected by the regular inspectors of the government.

DIFFICULTIES IN SUCCESSFUL OPERATION OF GOVERNMENT SANATORIUMS

One of the most serious obstacles in the operation of government sanatoriums is the scarcity of physicians and nurses specially trained in tuberculosis. It is asserted by the American Sanatorium Association that the medical and nursing services are three times as important as climate, site, buildings and equipment. The United States Public Health Service has doubtless had occasion to verify the truth of this assertion.

In times past, medical colleges have stubbornly neglected the diagnosis and treatment of tuberculosis in their curriculums, and the vast majority of nurses have been graduated from their training schools without having had the slightest instruction relative to this disease, with the result that there has not been a sufficient specially trained medical and nursing personnel to meet even the normal needs of our civil population.

Theoretically, many of the government sanatoriums are too large to attain the maximum of service for the individual patient, six of them ranging in capacity from 500 to 1,000 beds. On account of the shortage of medical personnel, it has been found impossible to secure entirely satisfactory commanding officers and chiefs of medical service for all of the existing institutions, and it would be out of the question to man satisfactorily a large number of hospitals of smaller bed capacity. To overcome the disadvantages of the large institution as far as possible and to give to the patient that personal contact with his physician essential to the best results, the Public Health Service is striving to make the ward surgeon the administrative and medical head of his own ward, so far as this may be practicable, thereby creating within each large institution a considerable number of units, constituting, in fact, small individual sanatoriums whose successful operation will depend in a large measure on the intelligence, efficiency and personality of the ward surgeon.

PROBLEMS REQUIRING ATTENTION

It is the earnest desire of the Public Health Service and of the Assistant Secretary of the Treasury, Col. Edward Clifford, under whose jurisdiction all of the activities for the care of soldiers are now centered, to operate government sanatoriums in such a manner that they may be entirely above criticism. To accomplish this desirable end, the physicians who made studies of government sanatoriums have recognized that a number of basic faults will have to be overcome and that there will have to be modifications and

changes in a great many details. In the attainment of this end, much may be done by the Public Health Service itself, but much will also have to be done in the creation of public sentiment which will eliminate those conditions over which the Public Health Service now has little or no control.

A satisfactory medical and nursing service will have to be developed by the government through the education and instruction of such physicians and nurses as are available, this being done in most of the institutions through classes of instruction which are usually being intelligently conducted.

The nursing service will have to be improved by a little closer cooperation between the medical and nursing staffs and by the provision of better living conditions and more amusements and diversions, especially in the more isolated posts, whereby there may be overcome the pernicious social relationship between patients and nurses which was found to be a demoralizing factor in most of the institutions inspected. If the present shortage of graduate nurses of the better class cannot be overcome, it will be necessary for the government to train female attendants as is done in most of the private sanatoriums.

The most serious fault in these government sanatoriums, and one which will be overcome only with the greatest difficulty, if at all, is the flagrant lack of discipline to be observed in practically all of the institutions. This is recognized by the more intelligent and serious minded patients as a distinct bar to their recovery. The patients generally are restive of restraint. They claim to be tired of military discipline and, on this account, it is possible that the uniforms and military titles of the medical staff serve as an irritant. There is considerable gambling. In most of the institutions, the use of liquor and of narcotic drugs is not unknown, while the use of tobacco and especially of cigarets, which seems to have been made a cardinal virtue during the war, is generally excessive. The patients apparently fail to recognize that reasonable discipline is an essential part of the treatment of tuberculosis, and seem to regard all disciplinary efforts as an arbitrary and offensive use of authority.

It was the opinion of each member of the inspecting committee that the men are being distinctly harmed by the possession of an excessive amount of money derived from federal compensation, and it was recommended that some legislative action be taken by Congress whereby compensation funds may be turned over to the members of the soldiers' families or accumulated with interest until the soldier is discharged from the sanatorium. In our opinion, it is only through some such action that the demoralization of discipline can be overcome; and, even then, that type of discipline essential to the well ordered sanatorium and the recovery of the patient will not be obtained unless public opinion can be in some way aroused to eliminate the well-intentioned but misdirected outside interference of politicians and others. So long as these restive and restless patients feel that their insubordination and hurtful indiscretions are condoned, and so long as the authority of the institutional heads is overridden by powerful political influence, government sanatoriums will fail to measure up to any sort of high standards and will fail to compare favorably with well conducted private institutions.

It is impossible at this time to go into deail in regard to these government sanatoriums; but the great problems, which will require the utmost effort on the part of the service, are the attainment of the necessary institutional discipline and the building up of the medical and nursing personnel.

As the problem of caring for the returned tuberculous soldiers will confront the federal government for perhaps twenty years to come, and as it will be necessary for the Public Health Service and the Bureau of War Risk Insurance to educate institutional physicians, medical examiners and nurses, if returned service men are to receive the type of care to which they are entitled, an educational machinery must be created by the government, and it appears that this machinery can be utilized not only to meet the government's needs, but in the elevation of professional standards throughout the nation.

If every physician and every nurse connected with the government sanatoriums is required to become proficient through special training and instruction, there will ultimately be available a large group of physicians and nurses who will find ready employment and who will be exceedingly valuable in the many county and municipal sanatoriums which are being established in all parts of the country through the influence of the war.

The Bureau of War Risk Insurance now has in every county and parish in the United States at least one medical examiner with a large number of acting assistant surgeons responsible for the medical care of soldiers. For the most part, this gigantic staff is entirely untrained in tuberculosis; but the Public Health Service has already created classes of instruction in the diagnosis and treatment of tuberculosis for its representatives, and these schools are now being taken over and operated by the Bureau of War Risk Insurance. While the courses are necessarily brief, the carrying out of the plan will result in our having in each county in the nation at least one physician who has given some serious thought and some study to the modern conception of tuberculosis.

In many of these schools, it has been found that private physicians, in no way connected with the public service, are making applications for admission. As the United States Public Health Service is primarily interested in the prevention and suppression of disease in the civil population, it is believed that these classes can be made tremendously valuable by becoming permanent teaching centers available to all physicians.

It also appears possible in the future to utilize the government sanatoriums now in operation or under construction, and especially those situated near the large centers of population, as more pretentious schools for longer courses of instruction similar to the private schools now operated at Saranac Lake and at Colorado Springs.

The development of this educational service in tuberculosis will not only tend toward the betterment of tuberculosis practice throughout the entire nation, but will stimulate interest in and about government sanatoriums in such manner as to guarantee to the tuberculous soldiers of the country an infinitely better type of medical service and institutional care than they are receiving at the present time.

Specialization in Tuberculosis.—All the available resources for giving intensive and yet comprehensive practical instruction in tuberculosis should be organized and placed within the reach of all who wish to specialize in this subject, and any others who would care to avail themselves of the opportunity.—D. B. King, *Brit J. Tuberc.* **5**:56, 1921.

PUERPERAL MASTITIS *

FRANKLIN A. DORMAN, M.D.
AND
JAMES K. MOSSMAN, M.B. (TOR.)
NEW YORK

The appearance of acute infection in the nursing breast is sufficiently frequent, even in well regulated hospital services, to receive careful attention. The occasional termination of such an infection in mammary abscess is an obstetric calamity. Therefore, we believe that without apology, in spite of a number of excellent recent articles on this subject, further consideration of this infection may not be untimely.

As the title "puerperal mastitis" suggests, we propose in this discussion to devote our attention to those disturbances which occur in the early weeks post partum. The hospital supervision of maternity patients in many cases ceases, provided there has been a normal puerperium, after two weeks. Therefore, many late infections are not seen unless reported back for treatment or detected in the follow-up work.

Our present hospital system keeps in touch with the patients until three weeks post partum.

Undoubtedly, the care of the breasts in the first two weeks has much to do with the avoidance of later infection. From the relatively rare occurrence of breast disturbance in cases in which nursing has been well established, it is certain that much of the morbidity from breast infections will be prevented by proper guidance and instruction of the nursing woman.

The importance of this condition cannot be overestimated. A sharp infection of breast parenchyma, even if quickly subsiding, may cause a termination of successful lactation. There is profound nervous disturbance in many of the cases. It is conceded that some of these inflammations may leave an irritation that will be the cause of later malignant growth. A substantial percentage will suppurate, with the sequelae of operative interference, destruction of breast tissue, more or less protracted convalescence, and profound nervous depression. To this is added loss of function for the time and probably in later pregnancies. In hospital or private practice, such an experience causes much dissatisfaction.

As this is a condition due to infection, it is our duty to inform ourselves of the normal incidence of this complication and to strive for the irreducible minimum.

There has been too much vagueness both in definition and in diagnosis of mastitis. Some teachers have failed in definiteness. When promptness of recognition and treatment weigh so much, this should not be.

An attempt to find the various recorded incidence of mastitis revealed wide variations in statistics, from Jewett's statement of from 5 to 6 per cent., to the statistics collected from varying sources by Norris in the *American Journal of Obstetrics* for July, 1918, in which he quotes a range of from 0.5 to 4 per cent. Gardiner [1] quotes Webringhaus with 2 per cent., and Fehling, 3.18 per cent.

Our statistics were compiled from a consecutive series of 2,000 patients delivered at the Woman's Hospital. There were fifty-seven cases diagnosed as mastitis, an incidence of 2.8 per cent. Our patients are kept in the hospital for fourteen days post partum. Nine of these cases occurred after the date of customary discharge; three of them were readmissions.

CAUSES OF INFECTION

The causes of breast infection may be summed up as germ contamination plus diminished resistance. The old theory of "catching cold" is disappearing from the textbooks, but is still difficult to extirpate from the lay mind. The cause of the persistence of this tradition probably lies in the initial chill, which is the first symptom recognized.

The presence of the contaminating germ, especially *Staphylococcus albus,* in the normal maternal ducts, has caused much emphasis to be laid on the theory that milk stasis with increased germ activity has permitted bacterial invasion of the tissues. Accordingly, much zeal on the part of nurses in the use of massage or breast pump has in the past been encouraged to avoid such a development.

It is believed that a saner view of the situation is now prevailing. As breasts in which nursing is suspended or not attempted rarely show mastitis, it is more probable that manipulation of distended breasts may diminish the natural resistance of the tissues and increase the liability to infection.

The contamination of nipples by outside organisms is probably the commonest method of infection, especially in those of the severer type. Damage to the nipples from cracks, fissures or erosions undoubtedly favors the entrance of these germs. Infectious contacts may be from fingers of attendants or from fingers of the patient herself, possibly contaminated by handling lochial pads or from the nightdress or breast binder. De Lee, in his textbook, emphasizes the importance of the infant as the source of infection, whether from sprue, pharyngitis, coryza, ophthalmia, or pustular infections—especially of the face. To this list, might be added paronychia.

Our statistics showed 22.75 per cent. of infantile complications were recorded in the histories of these mastitis cases, as against 10 per cent. as a general nursery record. Of these, eight were conjunctivitis cases; three, pustular, and two, coryzas.

Some years ago, a private patient of mine suffered repeated mastitis attacks in different parts of both breasts, which disappeared after the healing of some mildly inflamed but discharging forceps injuries on the cheek.

The chance of the nursling's transmitting infection from an inflamed to a normal breast by changing the child immediately from the affected side to the other is so great that the nurse and mother must be instructed to avoid such a sequence. Blood stream infection is probably rarely encountered.

TYPES OF INFECTION

The types of infection vary from parenchymatous to primary interstitial. There is a phlegmonous type, usually with severe reaction, and there may be the slowly developing abscess with but slight initial rise of temperature. Another type, exceedingly mild, is that due to infection of the tubercles of Montgomery, the end-result of which is the areolar abscess. Rarely, the submammary abscess may result.

The early diagnosis of the infected breast is indispensable for successful treatment, as the opportunity for help is greatest in the early stages. There are

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-Second Annual Session of the American Medical Association, Boston, June, 1921.

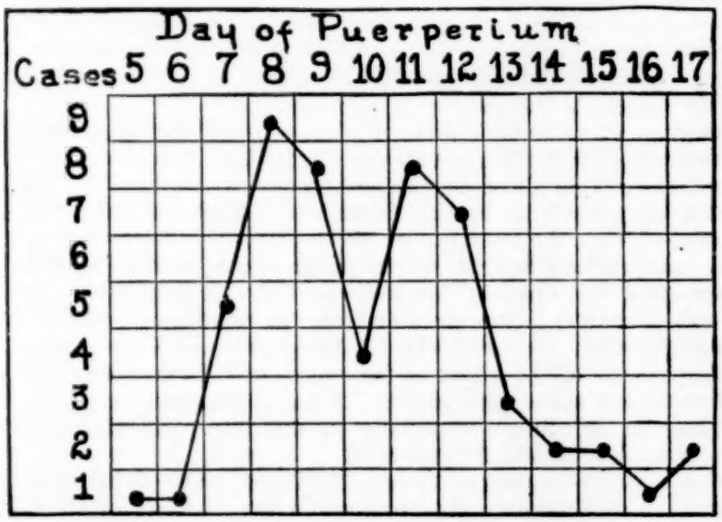
1. Gardiner, J. P.: Am. J. Obst. **80**: 506 (Nov.) 1919.

usually the chill or chilliness, malaise, and headache; the rapid rise of temperature, the localized tenderness of a segment of one breast, and possibly early redness —especially in the superficial interstitial cases. The infected breasts may show general congestion.

The onset of the infection in our cases showed that from the seventh to the twelfth day was the commonest time of incidence.

In our experience, the eighth day is the one peculiarly liable to show a beginning mastitis.

The local pain is not always marked. In confirmation of the diagnosis, palpation to elicit the area of tenderness may be necessary. On the other hand, nervous symptoms are pronounced. There is often a severe occipital and vertex headache. The rise of temperature is sudden, and may, considering the local degree of inflammation, be disproportionately high—from 104 to 106. These symptoms are explained by the close relationship of the organs of lactation to the central nervous system, and by the ready absorption of toxins from the breast.



Day of onset of infection.

The differential diagnosis between this condition and distended breasts ought to be simple usually: first, because of the time of the onset of the infection, that is, in the second week; second, because of the localization of the process, and last, because of the very slight rise of temperature that is likely to occur with distention. It is true that occasionally with uncomfortable breasts, in the presence of some sapremic temperature there may be a temporary obscurity in the diagnosis. The lay term "caked breasts" is partly responsible for confusion in diagnosis. There is also the general impression that congested breasts are the forerunner of infection.

Even among the profession, we find a careless use of this term. The term "caked breasts," if used at all, should be applied to those that are hard, congested, or distended, while mastitis should be clearly visualized as a local infection and inflammation due to germs, and with possibilities of suppuration.

Usually the course of the disease tends toward rapid resolution. The fever, from its initial high peak, under proper treatment promptly and progressively declines until at the end of twenty-four or forty-eight hours it has reached normal. Some local tenderness may continue for several days. If the fever does not disappear, pus formation is probable. Should the temperature fail to show a steady decline or develop recessions in the initial twenty-four or forty-eight hours, either there is pus formation or the infection of another segment of one of the breasts.

FREQUENCY OF OCCURRENCE OF BREAST ABSCESS

The frequency of the occurrence of breast abscesses is variously given by different authorities. Baer and Reis report from the Michael Reese Maternity Hospital, 0.23 per cent. occurrence in normal times, with a rise to 1.74 per cent. during the influenza period. Weibringhaus reports 0.21 per cent.; Fehling, 0.6 per cent.; Norris, 0.45 per cent. Our own statistics showed 0.4 per cent.

The occurrence of suppuration in proportion to mastitis attacks is given by Weibringhaus as 8.33 under Baer treatment to 16 per cent.; Fehling, 19.3 per cent., our own statistics, 14 per cent.

The abscess may be of slow formation, and its recognition thereby delayed for some days after the beginning of infection, and even after the subsidence of fever. If deeply placed, fluctuation is late in appearing, the only symptom being an indurated lump, gradually increasing in size. In slight cases, the formation of pus may be in the larger ducts near the nipple, where, at times, a cure has been effected by the systematic emptying of these ducts.

TREATMENT

In approaching the subject of the treatment of mastitis, one almost hesitates to advocate his method. The fierce conviction with which various authorities urge treatments of great diversity and give different indications argues Nature's response to be kind under many different handlings. Teachers seem to have varying theories, and in this connection, it is interesting to note Baer and Reis' [2] article, with their careful study of the technic of breast care in twenty-nine different maternities

They note "the great diversity of opinion is found in those conditions in which prophylactic treatment is most imperative, i. e., the treatment of pathologic nipples, of breast congestions, lymphangitides, and threatened abscesses," and suggest that possibly a study of the various treatments may serve to unify the kind of treatment in a particular condition.

Is there a possibility of developing a standard treatment for mastitis? Probably not, until some one can bring forward satisfactory statistics in a large number of cases which will carry conviction.

In prophylaxis, there cannot be such a wide divergence of opinion. That prenatal care, with advice, especially to the primipara, in regard to cleanliness, and in the case of depressed nipples massage is helpful, no one can doubt. After birth until the milk comes in, very brief nursings, from three to five minutes, with intervals of from four to six hours, is important. Cruel damage to the delicate epithelium is often accomplished before the need for nursing exists. To diminish the acute congestion of the beginning of lactation, the lavish fluid diet so often given by nurses to hurry up the coming in of the milk should be forbidden. With the bugbear of distended breasts as a cause for infection cast from our minds, the prophy-

2. Baer, J. L., and Reis, R. A.: Surg., Gynec. & Obst. 32: 353 (April) 1921.

laxis in mastitis resolves itself into prevention of trauma to breasts and nipples and to the elimination of contact infection as far as possible.

Appreciable lesions of the nipples are not the only cause of infection, for breast abscess occurs not infrequently with the nipple apparently intact, while many patients with severely damaged nipples show no breast inflammatory reaction.

Our technic in the case of damaged nipples is to use a constant dressing of either tincture of benzoin or bismuth and castor oil, from 1 dram to 1 ounce, or the lead nipple shield. The last is the most valuable of all. With a damaged nipple, all nursing should be through a glass nipple shield. In cases of bleeding, nursing is temporarily discontinued.

In the prevention of contact infection, the nipples are, when not in use, covered by a sterile compress or pad of gauze, 4 inches square, held in place by adhesive strips. This does away with the necessity of a binder to protect the nipple, besides providing a sterile dressing which remains in place unless removed by the nurse or physician. The effect on the patient is educational, establishing a *noli me tangere* attitude toward the nipple.

Further prophylaxis involves the rapid clearing up of all infantile infections, and in case of one-sided mastitis, the prohibition of consecutive nursing from the infected side to the normal one.

In our first 1,000 cases, in which the particular protective dressing described above was not employed, the mastitis incidence was thirty-six cases, with five abscesses. In the last 1,000 cases, coincident with the adoption of this dressing, the mastitis incidence was twentyone, with three abscesses.

The treatment of the mastitis, as soon as diagnosed is a cardinal point in success. The diversity of treatment may be seen in the accompanying table.

DIVERSITY OF TREATMENT OF MASTITIS

	Massage	Pumping	Nursing	Tight Binder	Cathartic	Restrict Fluid	Cold	Heat
De Lee.....	No	No	No	Yes	Yes	Yes	....	....
Williams.....	...	Yes	No	Yes	....	....	....	....
Jewett.....	No	No	....	Yes	Yes	Yes	....	....
Cragin.....	Yes	Yes	Yes	Yes	....	....	Yes	....
Norris.....	No	No	Yes	Yes	Yes	....	No	Yes
Michael Reese Hospital.....	Yes	Yes	No	Yes	Yes	Yes	Yes	....

Certain therapeutic measures seem to have almost universal acceptance. These are the use of cathartics and the employment of a binder for pressure and support. The limitation of fluid in the diet is generally accepted also. An overwhelming majority use ice locally until the presence of suppuration is suspected. The moot points are those which involve the emptying of the breasts by massage, pumping or nursing.

From the study of Baer and Reis' table, it would seem that the statistics of those continuing nursing were about the same as those who stopped it. We believe that the breasts, in the absence of nipple injury, are most safely emptied by the infant, and that the continuation of nursing increases the chance of successful lactation. If, therefore, the attendant believes in the value of depletion at this time, the infant may be the safest agent for accomplishing this purpose. Massage and pumping must be most carefully and gently employed, but may be necessary to supplement the child's nursing.

The failure in the treatment of simple mastitis is evidenced by the proportion of cases in which there is pus formation, and it is by this result that the therapy must stand or fall. When the physician can show a lower incidence than one half of one per cent. in abscess cases in women who have been followed for a period of three months, that treatment should be regarded with respect. Moreover, the ratio of pus cases in proportion to the mastitis cases should be of value.

It is obvious that the mastitis incidence in a hospital in which the patients are discharged on the eighth or tenth day post partum will be insignificant, and statistics based on such short observation valueless.

When the presence of suppuration is suspected, a change from cold to heat gives comfort and hastens localization. All breast manipulation should cease, including nursing. Free incisions with counter drainage by rubber tubes and irrigation with surgical solution of chlorinated soda (Dakin's solution) will hasten recovery.

CONCLUSION

We would urge: (1) more effort toward the prevention of contamination in the first and second weeks of the puerperium; (2) general training of staff and nursing force, that the earliest recognition of infected breasts may be achieved; (3) prompt treatment of the infection by some rational method which will stand the test of figures showing a minimum of suppurative termination.

133 East Fifty-Seventh Street—141 West One Hundred and Ninth Street.

ABSTRACT OF DISCUSSION

DR. HOWARD T. SWAIN, Boston: I wish to emphasize the importance of prophylaxis in these cases. Few cases of breast abscess are not preceded by some difficulty in nursing. It is of the utmost importance to be careful in putting the baby to the breast in the early days following its birth. Long nursing of the nipple from which nothing is obtained is probably one of the most common causes of injury to the nipple, which goes from bad to worse, and forms the opening in the tissues through which infection enters. With reference to protecting the nipple, I believe the lead nipple shield is a great aid, not only when the nipple is small, so that the baby is unable to get hold of it, but also when the clothing moves about and irritates the surface of the nipple. The lead nipple shield will prevent such disturbances. If we regulate the nursing of the baby, being sure it goes to the breast at long intervals and for only a few moments, until the nursing is established, we shall have far fewer breast abscesses. With reference to the treatment, massage should be absolutely omitted. I do not believe that massage of a tender breast should ever be allowed. Also, after we have put ice to the breast it is a great mistake to put the baby to the breast without allowing sufficient time for the freezing or chilling which the ice causes to pass away. It is very wrong to take the ice cap off the breast and put the baby to the other breast immediately, as is so often done. There should be an interval of twenty minutes or half an hour after the removal of the ice cap before the baby is put to the breast. With reference to fluctuation as a determination of the presence or absence of pus, I have never found that of any special importance, because it is so hard to make out in breast tissue. I do believe that the presence of edema over the area is important. Up to the time that edema of the skin appears there may be a question as to whether or not actual suppuration is going on. But once definite edema of the skin over the inflamed area appears, there is no question that pus is present, and the sooner it is evacuated the more rapid will be the recovery of the patient.

DR. FRANKLIN A. DORMAN, New York: I do not want this discussion to end without approving the occasional use of massage. The baby is a good source of depletion in mastitis, but intelligent massage may be necessary, even the occasional use of the breast pump. The appearance of edema, while a rather late sign, may be misleading, because it is not invariably a sign of suppuration. It may indicate a superficial inflammation rather than a deep one.

COOPERATION BETWEEN A CENTRAL STATE LABORATORY AND LOCAL MUNICIPAL AND COUNTY LABORATORIES *

AUGUSTUS B. WADSWORTH, M.D.
ALBANY, N. Y.

It may be taken for granted that every state has one or more public health laboratories connected with its department of health, and it is unnecessary here to dwell at length on the importance of laboratory service. The growth of laboratory work in general medical practice, as well as in connection with all the specialties; the great increase in public health laboratory service during the war, together with the marked increase in the appropriations made for laboratory work in the federal and state services—all these facts bespeak a real interest, not only on the part of physicians, who understand their practical application, but also on the part of the lay public, who, after all, support the legislatures that make the necessary appropriations.

Although the public health laboratory has received extraordinary impetus, its growth has been so rapid that nowhere is there to be found a corresponding growth in standardization of its methods, nor is there cooperation in their work between different laboratories. In Great Britain, the Medical Research Council, since 1916, has taken steps with a view to standardizing methods in the laboratories. In this country, there is federal control, and some state control, of biologic products that are manufactured and distributed by laboratories. Nowhere, however, is the physician assured that the examination of his specimen is made in the most approved manner. He relies solely on his personal confidence in the laboratory technician who undertakes the examination. The service rendered depends entirely on a personal equation, and may suffice wherever the physician is in constant and close touch with the laboratory. In the public health laboratories which serve larger districts, however, and which are not in close contact with all the physicians they serve, standardization of methods is necessary.

PROBLEM OF STANDARDIZATION

There are doubtless many ways of approaching the problem of standardizing public health laboratory work, but, to obtain the desired results, it is wise to formulate a definite plan. It may be admitted, for instance, that there must be supervision and control by some recognized and responsible authority who has power to act: that minimum standards should be set, and thus an opportunity be given the laboratories that are capable of attaining the highest standards of work to improve on them. A system of inspection and of methods for testing the work that is done in the different laboratories is necessary, and, finally, a close cooperation between the central and all other laboratories is most desirable, if it is hoped that the results will be of reciprocal benefit.

A definite illustration of public health laboratory standardization is to be found in New York State. In fact, my chief reason for discussing this subject is to present in outline what has been done here along the lines indicated. In spite of serious and distracting interruptions, definite progress has been made each year, since 1914. At that time, the Division of Laboratories and Research, a small laboratory with only seventeen workers, was completely reorganized. Since then it has developed until, today, it carries on practically all the public health laboratory work that is of definite value to health officers in the field, and to physicians in their practice. The first problem was to organize and standardize the work within the central laboratory.

The first step toward reaching out to the standardization of the laboratory work generally throughout the state was made when the Sanitary Code established by the Public Health Council of the state, under legislative authority, prescribed that certain diagnostic examinations must be made in a laboratory approved by the Commissioner of Health. Later, not only the Sanitary Code, but also the laws of the state have amplified and extended these requirements. These laws require the laboratories engaged in public health work to secure the approval of the Commissioner of Health. In order to secure this approval, the local laboratories are to agree to adopt the prescribed methods of examination. Laboratories are approved for one year, and this approval is renewed on the first day of January each year. Laboratories are required to adopt uniform methods of reporting and of keeping records, and also to keep permanent microscopic preparations for inspection on file for six months. All the local laboratories were inspected, to be certain that these requirements were such as were needed; and they are visited at intervals, to be sure that the approved standards are maintained. The inspection was found to be far from complete, so it was later supplemented by the practice of sending to the laboratories sets of specimens to be examined and reported on. By sending these specimens to a number of laboratories, and at the same time having examinations made in the central laboratory, it is possible to check not only the work of the local laboratories but also that of the larger central laboratory.

TRAINING OF WORKERS

The minimum amount of training and experience of the laboratory workers is prescribed. Since the war, the standard has been steadily advanced, in order to secure more competent and responsible bacteriologists and technicians. In the course of inspection and observation, workers were occasionally found who needed special training and experience, and they were advised to spend a short time in the central laboratory in order to perfect their technic. This privilege, instead of proving onerous, has been so frequently welcomed by the workers in the local laboratories that a few of them now make a practice of visiting the central laboratory at regular intervals. The workers in the local laboratories are isolated by the very nature of their work and an exacting routine, with all sorts of handicaps in the way of insufficient funds and all that lack of money entails;

* From the Division of Laboratories and Research, New York State Department of Health, Albany.

* Read before the Section on Preventive Medicine and Public Health at the Seventy-Second Annual Session of the American Medical Association, Boston, June, 1921.

and with, perhaps, little sympathetic or understanding encouragement, even if they chance to be located in some of the large centers of medical education. The central laboratory, having the authority to insist on certain standards, is often in a position to secure for these local laboratories satisfactory conditions of work which they are unable to get for themselves. Thus, instead of antagonizing the workers in the local laboratories, the work of inspection and supervision has aroused a most gratifying interest in the whole problem of standardization, as is witnessed by the formation of the New York State Association of Public Health Laboratories, which has now a rapidly increasing membership.

GOVERNMENT OF THE ASSOCIATION

In order that the larger laboratories may not predominate in the councils of the association, each laboratory has only one vote in all matters of policy. There are regular and associate members, and two meetings are held each year, one with the New York State Medical Society and the other, in midyear, at the central laboratory in Albany. This association, by lending its support and wise counsel, promises to make permanent and to stabilize the work of the central laboratory. The high aim and purpose of the association as set forth in the constitution and by-laws are of interest:

> The purpose of this Association shall be to increase the efficiency of the several laboratories engaged in public health work in this state; to unify the interests of their workers by stimulating among them the spirit of common understanding and cooperation; and to encourage the constant effort toward the improvement and standardization of technical methods to the end of securing increasingly high standards of scientific achievements in the work performed by the several laboratories.

EQUIPMENT

Cooperation between the laboratories, and the standardization of their work, have now progressed to a stage at which the benefits are reciprocal. The central laboratory is so much larger and so much more completely equipped that it is obviously better qualified, not only to perform a large amount of daily routine, but also to make complicated and unusual examinations; and it offers exceptional opportunities for the prompt testing of difficult technical procedures. It is especially fitted to prepare the standard serums, vaccines and antitoxins, and other biologic products. In emergencies, the central laboratory, with its large staff, is able to assign workers to the local laboratories for the time necessary. It maintains a large bacterial collection, which is available for the other laboratories, and similarly a museum for unusual and interesting specimens, to be used for demonstration and teaching purposes. The central laboratory thus constitutes a scientific background, not only for the local laboratories engaged in public health work for a district, but also for the university laboratories. Local laboratories, on the other hand, are much better qualified to carry on the routine diagnostic work for a district, and to exert an important educational influence, not only on the members of the profession who come in daily contact with the laboratory, but also on the laity.

CONCLUSION

The public health laboratories in all the states should unite, to secure for themselves a centralization of authority, and of responsibility for the direction and the results of standardization. They have opportunities for developing the work of standardization which are not to be found elsewhere, and it is a work which will dignify their profession. The laboratories which are engaged with the more abstract problems of research will turn to them to formulate and to test the practical application of their discoveries, and the university laboratories, in order to fulfil their teaching responsibility, will turn to the public health laboratories as models for the demonstration of technical procedure.

New Scotland Avenue.

MEASURES FOR INCREASING THE SUPPLY OF COMPETENT HEALTH OFFICERS *

JOHN A. FERRELL, M.D., DR.P.H.
Director for United States, International Health Board, Rockefeller Foundation
NEW YORK

The existing demand for health officers far exceeds the supply. Though an exhaustive analysis of the situation has not been made, those who are in touch with it know that there is a real shortage of men qualified to give direction to public health programs, and they feel that unless immediate remedial steps are taken, this shortage is certain to become more and more acute.

Public health executives are experiencing greater difficulty in finding qualified health officers than they are in securing appropriations for the expansion of public health activities. At least three state health officers within recent months have expressed concern as to whether or not they can use all of the money at their disposal, because of their inability to secure competent directors for the work.

The number of full-time medical health officers in this country at present is estimated to be above 1,000. The distribution of those in governmental health work, according to estimates, is given in Table 1.

TABLE 1.—FULL-TIME MEDICAL HEALTH OFFICERS ENGAGED IN GOVERNMENT HEALTH WORK

Public Health Service—commissioned	225
State boards of health	200
Cities and towns	250
Counties	175
Total governmental health officers	850
Nongovernmental health officers	150
	1,000

The demand for health officers comes from the United States Public Health Service, which has vacancies for commissioned and reserve officers; from states, which have vacancies for state health officers; from state health officers, who have vacancies for division chiefs and for district or county health officers; from cities and towns; from nongovernmental health agencies, and from progressive industrial corporations which, like the more progressive political units, have come to look upon hygiene and sanitation as essential to any program of intelligent and efficient industrial administration.

Any exact measure of the combined present and prospective demand for health officers is impossible, of course, but it seems clear that ultimately at least 7,000

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full-time men and women—most of them medical graduates—will be needed to fill directive positions in this field. As indicated above, about 1,000 such officers are now employed on a full-time basis.

Experience in county health organization indicates that for each typical county of 20,000 population, one full-time county health officer will be required, besides a staff of two public health nurses, a sanitary inspector, and a technician or clerk. Certain health officers feel that a somewhat smaller unit of working force will be adequate for the 20,000 unit of population. Public health nursing authorities, on the other hand, feel there should be ten public health nurses for each such unit, or one for every 2,000 inhabitants. The suggested basis is probably conservative and, in any event, it will aid in visualizing the situation. The cities, with their congestion and their special problems, it seems reasonable to assume, will require at least as large a health staff as the county requires for every 20,000 of their population. Applying this unit of health organization throughout the United States to the population of more than 105,000,000, and allowing the states and the federal government each a number of health officers equivalent to 10 per cent. of the number of local health officers, more than 7,000 full-time health officers will be needed, to say nothing of the public health nurses, the sanitary inspectors, and the technical and clerical employees, which would bring the total employees to over 29,000, as shown in Table 2.

TABLE 2.—FULL-TIME HEALTH EMPLOYEES NEEDED

Health officers of first rank:		
Federal government	525	
States	525	
Local	525	
Total		1,575
Health officers of second rank or specialists:		
Federal government	525	
States	525	
Local	4,725	
Total		5,775
Public health nurses:		
Local		10,500
Sanitary inspectors:		
Local		5,250
Technical-clerical workers:		
Federal government	525	
Local	5,250	
Total		5,775
Clerical or special workers:		
States		525
Health workers of all classes combined:		
Federal government	1,575	
States	1,575	
Local	26,250	
Total		29,400

If twenty years is taken as a reasonable period to allow for the development in public health work here anticipated, there will be need of 300 new health officers for directive positions every year, exclusive of those needed for replacement in governmental work, and exclusive of those who will be needed for nongovernmental health work. About 10 per cent. of the present number of medical school graduates, in other words, will need to be directed into public health work, if the service is to be cared for adequately. Only a small fraction of this number are now going directly into training for public health.

MEASURES NECESSARY TO DEVELOP SUPPLY OF COMPETENT WORKERS

What are the steps that must be taken, then, to develop an adequate supply of competent workers in this field? Several remedial measures suggest themselves.

Removal of Work from Politics.—Capable men will not enter the public health field unless there is a reasonable prospect that their work will be recognized as professional rather than political, and unless they can have reasonable security of tenure. In a number of states, the selection of the chief executive is a function of a board, which has a rotating membership similar to that of universities. In these states, the chief health officer and other staff members may expect to hold their positions on the basis of satisfactory service. As a result, a high type of professional spirit has developed. Elsewhere, instances have occurred in which the evil influences of politics have caused competent health officers to lose their positions, and this, in turn, has discouraged promising men from taking up the work as a vocation.

Much might be accomplished in correcting the present situation if a suitable agency could, after making a thorough survey, formulate a plan to be recommended to the states which would insure the selection of the most competent health officers available, and give to these, when selected, assurance of security of tenure on the basis of satisfactory service.

Adequate Salaries.—Where the position of public health officer has been regarded as more or less political in character, there has been a tendency to base the compensation on the scale allowed other office holders, who, in many instances, can qualify for their positions on the basis of merely a high school education, or less.

The competent health officer of today is required to invest from eight to ten years in completing his medical education, and in acquiring some of the fundamental principles underlying public health. If he needs all this training in order to discharge his responsibilities, his compensation should be sufficiently large to justify the investment. A scale of living which will compare favorably with that ordinarily to be had by competent practitioners of medicine, law, and the other professions, should be permitted him. Unless, in addition to making tenure secure for competent men, the compensation scale is made sufficiently attractive, capable men in adequate numbers will not choose public health as a vocation.

The progress which has been made in recent years has been encouraging, but much remains to be done. Where qualified health officers have produced tangible results, the communities giving them employment have generally shown a disposition to meet competition in the matter of salary. Time, educational work in its broadest sense, and sound public health programs, including striking demonstrations, will be necessary before those who shape governmental policies will fully recognize the professional character of the health officer and compensate him accordingly.

Encouragement to Students.—Public health work as a career should be kept constantly before students. Special provision should be made not only for teaching public health to students in medical schools, but also for acquainting them with the opportunities open to capable men, for finding careers in preventive medicine. Even in elementary and secondary schools, the principles of hygiene and public health should be systematically taught. Schools of engineering, and colleges and universities, in addition to teaching hygiene and public health, might well encourage their stuudents to specialize in the public health aspects of such subjects as sanitary engineering, sanitary and food chemistry, sta-

tistics, and public health nursing. The opportunities for careers in preventive medicine should not only be taught in the schools, but should also be presented by public lecturers, and by publishers of professional and popular periodicals. Press articles regarding striking achievements might prove helpful in stimulating interest in this field.

Provision for Advanced Training.—There must be more adequate provision for advanced training in public health. Generous support should be given to such institutions as the Harvard School for Health Officers and the School of Hygiene and Public Health established by Johns Hopkins University. The existing training facilities are inadequate. Further development in this direction is imperative. In addition to teaching the fundamental sciences, each public health school, by having an intimate working relationship with federal, state and city health authorities, can provide practical field training for its students and fellows. The schools of public health, moreover, by research as to disease, its mode of spread, and the methods for its prevention and cure, may enlarge and extend our knowledge. Thus we shall be aided in conducting field demonstrations, which afford the most effective method of educating the public as to the wisdom of supplying the money and the conditions essential to the success of public health activities.

Better Teaching of Hygiene.—There should be better teaching of hygiene to undergraduates in the medical schools. It is the duty of the physician to safeguard not only the patient, but also the patient's family and the patient's neighborhood, against preventable sickness. He may neglect opportunities to render service if he is not taught to view a case of communicable disease from the public health or the community standpoint.

Practically all of the birth and death certificates, which give us a basis for morbidity and mortality statistics, and, in turn, afford guidance to public health authorities, and a measuring rod of progress in the prevention of sickness and death, are prepared by physicians. Unless physicians know the significance of accurate reports, and the fundamental importance of their cooperating with the health authorities, the welfare of the public will suffer.

Moreover, the majority of the health officers at present are selected from the ranks of practicing physicians, and it is not generally practicable, or at least it has not been in the past, for them, on assuming such duties, to take special training; and even in instances in which physicians may not serve as health officers, they are frequently called on to serve as counselors on boards of health.

Increasing interest in this matter has been manifested on the part of medical organizations during recent years: and only this spring the Conference on Medical Education in Chicago adopted a committee report recommending an undergraduate department of hygiene in every first-rate medical school, under a full-time instructor, with a minimum of ninety hours devoted to the subject.

Provision for Training Facilities.—Training facilities should be provided by federal and state health organizations. Short courses for health workers in service should be instituted. Although accurate information is not available, we may assume that there are now from 6,000 to 10,000 public health workers, of all grades, in this country. Most of them entered the field without first obtaining special training. Many of them have demonstrated exceptional ability, and they should have the opportunity to advance. If intensive practical training courses are provided for them there will be improvement in the quality of their work, and many of them will be enabled to advance to more attractive positions.

A number of state boards of health have conducted, with encouraging results, institutes for health officers and public health nurses. It is to be hoped that these significant beginnings will be developed and extended, so that the rank and file of public health workers may better equip themselves for their duties and thus raise the standard of public health service rendered. As the state and local health organizations grow, there will be an increasing demand for training facilities of this character, which may also be expected to serve incidentally as feeders to the institutions for more advanced training in public health.

Education of the Public.—The public should be educated to know and value public health work. The public provides the funds and sanctions the laws regulating the conditions pertaining to service in this field, and only through intelligent public opinion is it possible to obtain the community cooperation essential to satisfactory results.

A successful demonstration in health work often removes the work of the health officer from the plane of theory and generalities to that of a definite, clear-cut business undertaking, the value of which can be appreciated by the average citizen. Where such demonstrations have been conducted, the public has shown a willingness to provide adequate funds, to give due consideration to compensating the health officer, and otherwise to render his work interesting and satisfying.

Establishment of Fellowships.—Fellowships should be established for men and women of unusual promise in this field. Many health officers possess the personal qualities essential to successful careers, and would gladly qualify themselves for better positions by taking advanced training in public health, if such a course were possible. Usually they are underpaid and are unable to meet the cost of further training. Again, men of exceptional ability who have taken an academic course, the course in medicine, and a year in a hospital come to appreciate the possibilities and attractiveness of a career in public health; but having been taught the importance of thorough training for duties to be undertaken, they are unwilling to engage in public health work without special training, and they are financially unable to prolong their studies. In cases like these, the cause of public health can be served in a most constructive way if provision is made for granting scholarships or fellowships. The International Health Board is already contributing aid in this direction, in this country and in a number of foreign countries, and it is hoped that other health agencies and individuals may see the wisdom of providing fellowships in public health.

SUMMARY

The demand for qualified health officers already exceeds the supply, and the rapid expansion of public health activities will be limited by the supply of qualified health officers to a much greater extent than by a lack of funds. Measures that have suggested themselves for increasing the supply of qualified men are:

1. The divorce of health work from politics.
2. Increase in the compensation of health officers.
3. The acquainting of students, medical and academic, with the opportunities for careers in preventive medicine.
4. Provision of advanced training in public health in a few institutions well equipped and strategically located.
5. Teaching of public health in medical schools.
6. Encouragement of federal and state institutes for training health workers.
7. Education of the public to understand and value health work.
8. Provision of scholarships and fellowships in schools of public health for present and prospective health officers.

61 Broadway.

ABSTRACT OF DISCUSSION

Dr. Milton J. Rosenau, Boston: If we are to entice men into public health work, this cannot and should not be done by pressure from without, but by allurements from within. When the profession of public health becomes attractive enough, then there will be a natural flow of good men into the field. I see a number of men here who have made a success in public health administration and whose achievements are acknowledged not only in this country but also abroad. Which school did these men attend? They went to the school of experience. There were no schools of public health in those times. Nevertheless, I am quite sure that not one of these men would advise that that rocky road should be followed by coming generations. Our curriculum and our drift is not toward that "practical" aim, but to give the fundamental education on which sound health administration must rest. All that we can hope to do is to give the training and direction for the innate qualities which our students may have. Therefore, we have stressed what may be called the fundamental sciences in giving training for public health service. A distinction should be kept in mind between "the medical officer of health" and "the health officer." When you look more intimately into the work of the medical officers of health, you find that most of their work is medical work. They deal with the sick and the problems of sickness, and I should say that it would be better to call them medical officers of sickness than medical officers of health, because they do not handle the questions of prevention in the way that we think should be done by the health officer. The distinction has been made several times this morning between preventive medicine and curative medicine. That distinction is artificial, although it requires special direction and special application in order to achieve success in either one. While it is quite true that health administration and health work deal rather with diseases of the community, whereas private practice deals with individuals and individual problems, yet there is another field which should always be kept in mind, and that is the question of personal hygiene. This is strictly individual, although truly a problem of public health. And by personal hygiene I do not mean the prevention of contagious or communicable diseases. I mean increased efficiency, which will make for individual happiness and greater usefulness in the world. It is a problem of physiology and for that reason we have given it prominence in our schools. The reason for shortage of health officers in the country, in my opinion, are (1) education—professional education and education of the public; (2) political independence, at least a sure tenure of office, otherwise you cannot expect to attract good men and keep them; (3) economic satisfaction, which every man should have, and (4) recognition of service by the public.

Dr. David L. Edsall, Boston: I quite agree with what Dr. Ferrell and Dr. Rosenow said, but there are one of two things about which I do have some strong feeling, and one of them was mentioned by Dr. Ferrell, namely, the influence of the medical school itself. We do not realize the influence of the college and the instructors on the professional choices that the men make subsequently. A student depends openly or subconsciously on the influence he gets from his instructors, and I believe that item very largely determines the interest the men take in special lines. Unquestionably, the great majority of men in the schools should go into the practice of medicine, and it would not be good public service if we directed them into other lines. But there are certain men who are temperamentally better fitted for other work, and it is our duty to open the door to them and let them see what it is. One of the duties which we have begun to meet is to provide this opportunity. A young man very properly hesitates to go on and spend time and money, unless he has some confidence that he is thoroughly attracted to and fitted for the line of work he is contemplating, particularly after he has spent the many years he has in obtaining his medical degree. Imitating the colleges which have done so much in this way in the last few years, we have arranged opportunities for men, in the elective time they have, in order that they may choose their careers more intelligently. We have arranged in industrial medicine opportunities for men while in the medical school to take systematized electives for a period of two or three months at least, in which they may get a course which will make them better practitioners if they go into practice; but, on the other hand, if they want to go into public health work, they will have a taste of what it means and see whether they are thoroughly attracted to this career, and whether their qualifications fit them particularly for it. I hope that the medical schools can do a part which I think they have really neglected. The attitude of the medical school is still largely that the practice of medicine is only the study and treatment of the individual sick. It is still the principal duty, but in justice to the students there ought to be made apparent to them the other opportunities which are open, and let them choose which they want to take up.

Dr. John A. Watkins, Cincinnati: I want to call Dr. Ferrell's attention to the fact that he omitted from his discussion a group of medical men who are health officers in every sense of the word—industrial physicians. They are prosecuting intensively all, and more, that a city health officer prosecutes only extensively. They take the man and follow him from physical examination, the discovery of remedial disease in its incipience, his prompt treatment and institutional care, the supervision of his working environment, his home conditions and habits of personal hygiene to disability relief, rehabilitation, and old age pensions. I suggest also to those who are concerned with the problems discussed by Dr. Farrell that it might be profitable for them to look to industry for successful methods of meeting such. One thing, industry appropriates adequate funds to carry on the work and pays adequate salaries to the men who do it. Being out of politics, these physicians are also out of the seasonal unemployed class. Some industries in this country expend from $10 to $15 per capita a year for industrial health work against about 50 cents per capita spent by communities in public health work.

Dr. John A. Ferrell, New York: Practical field experience is an essential part of a man's training for public health work. The majority of our most competent health officers have secured their training in the school of experience. In former years, our leading physicians gained their training by reading under and associating with other physicians. Today no one would, of course, argue for a return to this plan. Thorough courses in medical schools are regarded as essential for men seeking careers in these fields. Does not the same principle hold in training men for the profession of public health? In all professions, the collegiate training must be supplemented by practical experience. The practicing physician can be immensely valuable in the field of preventive medicine. He should be taught, and the teachers in the medical schools be taught of the opportunity of the physician to render a great service to the community through the application of preventive measures. Dr. Watkins referred to

the service being rendered by physicians in the field of industrial hygiene and medicine. I wish to concur in his opinion, and to express appreciation for the valuable contributions that are being made in the field of preventive medicine by industrial physicians. From the standpoint of adequate compensation and security of tenure, the field of industrial medicine offers very attractive opportunities for careers.

RETROPHARYNGEAL ABSCESS *

IRA FRANK, M.D.
CHICAGO

To those of us whose work frequently entails the examination of the young for morbid processes the symptomatology of which lies outside the ordinary routine of diagnosis, there comes now and then a case of postpharyngeal abscess with a history of one or more previous examinations, possibly by men of known ability, with actual failure to locate the seat of disease. That this circumstance is not uncommon is indicated by a study of hospital case records of the disease, a majority of which show admitting diagnoses ranging from marasmus to meningitis, including pneumonia, croup, diphtheria, etc.; and we can all recollect cases of these abscesses to which we have been called as specialists to "examine the ears and sinuses" for possible foci of infection, in little patients with vague symptoms involving fever and leukocytosis, and affecting the digestive apparatus, and possibly the respiratory tract.

I have been sufficiently interested in retropharyngeal abscesses, owing perhaps to an unusual number of recent cases, to feel that, though possibly all that there is to say about them has already been said, nevertheless their occurrence is a possibility too rarely thought of in routine examination and therefore too frequently overlooked. With our modern conception of the physiologic activity and pathologic importance of the nasal, postnasal and pharyngeal lymphatics, the significance of their condition in diseased states of the nose and throat should be more universally held in mind, and I believe that any effort we can make to popularize the seriousness of the condition and its diagnosis, will be instrumental in relieving acute agony and, possibly, in saving life.

In preparation for this exposition, I have looked over the records of seventy-four cases of retropharyngeal abscess, which include my own cases and those of my colleagues at Michael Reese Hospital during the last ten years. This number of cases constitutes about 60 per cent. of the actual number of such abscesses treated during this period; the remainder were disregarded because of the lack of histories and records in the outpatient department.

HISTORY

Morell Mackenzie [1] states that the first mention of abscess in the retropharyngeal region is made by Galen, in the second century of the Christian era, who described a case terminating in spontaneous rupture, and who apparently had seen other instances of the same kind resulting fatally. Mackenzie then refers to a rather careful description of a case reported by Morgagni, in the middle of the eighteenth century, a fatal case because of rupture of the abscess into the trachea. Further references to the subject are made by Bleuland (1785), Abercrombie (1819), who reported three cases occurring in young children, and Sir Astley Cooper (1836).

Henoch,[2] who reported some cases in 1851, says that the first cases of retropharyngeal abscess were described by Fleming, in 1840. This statement is doubtless true so far as a careful diagnostic description is concerned, for Fleming gave a careful account of the affection, and even devised an instrument for the safe opening of these abscesses.

During most of the latter half of the nineteenth century, postpharyngeal abscesses were described as phlegmonous inflammations in the areolar tissue beneath the mucous membrane of the lateral and posterior pharyngeal walls, resolving with suppuration. For a time, following the teaching of Dupuytren,[3] subsequently indorsed by others, it was believed that the phlegmons were due either to injury of the throat with foreign bodies or to caries of one of the vertebrae or of the occipital bone.

It was through the anatomic investigations of Gillette [4] in 1867, demonstrating the lymph nodes and vessels of the retropharyngeal space, and the complete and painstaking study of a large number of cases by Bokai who, in his second communication, advanced the theory that the primary seat of morbid change occurred in the lymph structures, that the trend of medical opinion was altered. Bokai [5] was probably the first to show that the majority of these abscesses occurred independently of lesions of the spine. He regarded the formed abscess as primarily an affair of the lymphatics; but as he was unable to locate the etiologic factors in a majority of his cases he termed the largest group in his classification "idiopathic," which term persisted in the literature of the subject up to comparatively recent years.

ETIOLOGY

It has long been known that retropharyngeal abscess is essentially an affection of very early childhood; that it is seldom seen in children approaching puberty, and that it is rarely found in adult life. Bokai's series of 204 cases was gathered at the Children's Hospital at Budapest and of course included no adults. Brown,[6] in a recent article, maintains that 96 per cent. of the cases occur in the first six years of life. Henoch, in his Pediatrics, states that in his series of approximately thirty-five cases only one patient had reached the age of 3½ years. S. Vere Pearsons [7] asserts that only one of his seventeen patients was more than 2 years of age. All of Koplik's [8] seventy-seven patients were less than 10 years of age. Vas [9] has made a similar report from the Stefania Children's Hospital at Budapest.

Of my own seventy-four cases, seventy occurred in children under 10, four in adults, aged 18, 20, 28 and 45.

Brown [6] states that 50 per cent. of the cases in children occur in the last six months of the first year of infancy, and my own series would serve to confirm this statement.

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* Read before the Section on Laryngology, Otology and Rhinology at the Seventy-Second Annual Session of the American Medical Association, Boston, June, 1921.

1. Mackenzie, Morell: Manual of Diseases of the Nose and Throat **2**: 39.
2. Henoch, cited by Koplik: New York M. J. **63**: 440, 1851.
3. Dupuytren: Gaz. d. hôp. **5**: 374.
4. Gillette: Paris thesis, 1867.
5. Bokai: Jahrb. f. Kinderh. **10**: 108.
6. Brown, J. M.: Laryngoscope **29**: 9.
7. Pearsons, S. V., cited by Watson: Northwest. Lancet **123**: 192.
8. Koplik: New York M. J. **63**: 440.
9. Vas: Orvosi hetil. **153**: 61.

Vas' series numbered 1,054 cases, a continuation of those of Bokai, and shows 59 per cent. occurring in the first year of life, 35 per cent. in the first to third years, and less than 1 per cent. after the seventh year.

That the disease occurs in suckling infants was early recorded by Besser, Winternitz and others. In my seventy cases, the youngest patient was 3 weeks old. This case was one of four, all patients being under the age of 3 months. Exactly 90 per cent. of our patients were less than 3 years of age.

Thus definitely placing childhood as the important predisposing factor in retropharyngeal abscess, we must, while keeping in mind the lymphatic basis of the infection, take up, in similar detail, the exciting causes. In all of the following considerations, the chronic and "cold" forms of abscess due to tuberculosis and syphilitic caries of the vertebrae are excluded, as are the atypical abscesses due to direct injuries by foreign bodies, etc.

It will be shown in subsequent paragraphs how recent investigators are gradually completing the definite anatomy of the lymphatic distribution and drainage in the nose, throat and ear. In the light of these expositions, it has become somewhat less of a problem to account for the appearance of abscesses in the pharyngeal wall. It is no doubt a fact that, had the earlier studies of the process been made by laryngologists instead of pediatricians, the number of idiopathic cases would have shown a far less marked proportion in the etiologic considerations. (Bokai's tables show 10 per cent. of his cases following the exanthems, and 85 per cent. iodiopathic).

Among early observers, Lewandowsky [10] commented on two cases which impressed him as originating in the nose. He traced a connection between the lymphatics of the nasal chambers and those of the pharynx, and actually attributed the pharyngeal abscess to the diseased condition in the nose (1882). In this country, Agnew,[11] in the same year, published a case (of an adult) in which he was inclined to believe a carious and ulcerating tooth was the exciting cause, and Wiel,[12] about the same time, reported a case following a suppurative otitis media.

More recently, though there is a positive dearth of case reports, especially in American literature, there appears to be a general concession by writers on the subject that the abscess is the end-stage of a lymphatic gland involvement, due to a neighboring or remote infectious process occurring in the nose, sinuses, ears, mouth, teeth, pharynx and larynx.

ANATOMY

The retropharyngeal glands lie in the loose areolar tissue behind the pharyngeal wall and in front of the deep prevertebral muscles at the level of the upper two or three cervical vertebrae. They are placed in the so-called retropharyngeal space, a pocket of connective tissue extending from the base of the skull to the lowest extremity of the deep cervical fascia. Most [13] states that the glands are arranged in four groups, two on each side of the midline of the pharynx.

The most important of these two groups is the more lateral chain composed of one or two glands, rarely more, arranged vertically. These lateral groups are constantly present in infants and young children; in adults one of the chains may be absent. Superiorly, they are found just median to the carotid interna, near the entrance to the carotid canal. Projecting downward to the level of the mouth, they are often found below the soft palate in the posterior wall of the pharynx, lateral to the midline and almost hidden by the posterior pillars.

In children and infants there is found, very frequently, in addition to these lateral groups, a group of small glands in a more median position. These glands, described by Bokai and Most, occur unilaterally or bilaterally close to the midline, in the retropharyngeal space, and vary both in size and in number.

This variation of the lymphatic system in early childhood and adult life has, then, a most important bearing on one etiologic factor. In the first years of life there is actually present a number of glands which varies from three to ten or more; in the adult there is rarely found more than one or two in the entire postpharyngeal space. Beyond a time, therefore, when retrogression and atrophy of the glands take place there is, coincidentally, an actual and relative diminution in the liability and frequency of attack.

That the retropharyngeal glands receive afferent lymphatic vessels from the accessory sinuses of the nose, the nasal fossae, the pharynx and larynx, is mentioned in Gray's Anatomy, by Most, and by Delamère, Poirier and Cuneo.[14] The retropharyngeal group send efferent vessels to the internal jugular group of the superior deep cervical chain. Most asserts that the drainage to the postpharyngeal group from the nose and throat is only minor, and is accomplished by characteristic lymphatic anastomosis. He states that the principal drainage from the upper respiratory passages is behind the large vessels of the neck to the deep cervical glands. According to his investigations, only a small part of the lymph stream is diverted through the retropharyngeal nodes. In any event, it is now definitely proved that directly or indirectly the lymph passing through the retropharyngeal glands contains in part that draining through the passages and cavities of the upper air tract.

By injection in child cadavers, André [15] followed the lymphatics of the antrum through the middle meatus as far back as the eustachian tube. Grünwald [16] had a similar result for all the accessory sinuses in the adult cadaver. With animal injection (dogs), Noyes and Dewey [17] demonstrated a lymph way from the teeth to the submaxillary chain. More recently, Mullin and Ryder [18] have demonstrated in rabbits a lymphatic absorption from the antrum, the frontal sinus, the palate, and the tissues of the face, through the submaxillary and internal jugular groups, the latter being the chain corresponding to the retropharyngeals in man.

PATHOLOGY

There has been an effort made by a number of writers to classify and distinguish between abscess formation in the lateral and that in the more median groups of glands. Broca [19] applied the name "peripharyngeal abscess" to what should now be considered as the more common type of retropharyngeal suppu-

10. Lewandowsky: Berl. klin. Wchnschr., 1882, p. 116.
11. Agnew: M. & S. Reporter **46**: 313.
12. Wiel: Monatschr. f. Ohrenh. **15**: 43.
13. Most: Chirurgie der Lymphgefässe und der Lymphdrüse, 1917, p. 27.
14. Delamère Poirier and Cuneo: The Lymphatics, p. 254.
15. André: Ann. d. mal. de l'oreille, et du larynx **31**: 425.
16. Grünwald: Arch. f. Laryngol. u. Rhinol. **33**: 1.
17. Noyes, F. B., and Dewey, K. W.: The Lymphatics of the Dental Region, J. A. M. A. **71**: 1179 (Oct. 12) 1918.
18. Mullin and Ryder: Laryngoscope **31**: 158.
19. Broca, quoted by Irish: Illinois M. J. (May) 1919.

ration Heiman [20] later substituted the term "parapharyngeal" to the affections of the lateral group, which he considered as continuous with the jugular chain.

There is, however, no reason to subdivide and classify the clinical retropharyngeal suppuration. Such classifications are apt to be more confusing than helpful in arriving at a diagnosis. Anatomically, the various subgroups of the deep cervical glands lie close together; physiologically, they are continuously interdraining; clinically, one or more of the glands suppurating and pointing in the retropharyngeal space becomes a retropharyngeal abscess.

Such is the simple mechanism for the presentation of the abscess in the posterior and lateral walls of the pharynx; and it is logical and convenient to suppose that all the variations of retropharyngeal abscess are merely suppurative processes in one or more of the postpharyngeal groups, pointing in the direction of least resistance, increasing in size and content, and controlled in its spread by the neighboring planes of deep cervical fascia, as a circumscribed intraglandular abscess, or rupturing and burrowing beneath the fascial planes.

For the abscess, left to itself, the following courses are open:

1. It may burst spontaneously and drain its contents into the pharynx.

2. The pus may burrow its way laterally to the side of the neck behind the large vessels and the sternocleidomastoid muscle, guided by the prevertebral fascia, behind which it is situated, into the posterior lateral triangle of the neck. Or should it weaken and rupture through the fascia, it may present itself anterior to the sternocleidomastoid muscle in the anterior triangle.

3. The pus may be guided downward by the prevertebral fascia to the lower part of the neck. The fascia passes behind the subclavian trunks, and, forming the posterior wall of the sheath of the axillary vessels, may actually guide the pus under the clavicle and into the axilla. (This rare type is usually the chronic cold abscess of a cervical Pott's disease.)

4. The abscess may travel downward behind the esophagus into the posterior mediastinum.

Cases illustrating these peculiar and remote presentations appear occasionally in the literature. Thus, in cases reported by Ripley [21] and by Richards,[22] the abscesses extended as far down as the first and third dorsal vertebrae, respectively. In Mercier's [23] case, the pus passed downward behind the subclavian trunks and appeared below the clavicle. The early cases of Agnew and Trelat are typical of the burrowing of pus laterally behind the prevertebral fascia, with presentation at the sides of the neck. Taptas [24] has recently reported a case, and there are a number of similar instances in the literature in which the pus traveled downward, producing an involvement of the mediastinum.

Very little has been written in explanation of the greater frequency of the condition in early childhood as compared with its incidence in adult life. Goldstein,[25] in 1908, said that, in the light of the known unusual activity of the lymphoid tissue and the lymphatic ring in very young children, it would be logical to "assume that whenever an acute infectious process takes place in the nose, nasopharynx, accessory sinuses, ear, tongue or larynx, a continuity of lymphoid tissue may carry such an infection into the depths of the pharynx walls"—where, during childhood, are an unusual number of nodes. Goldstein says, further:

> If the presence of this lymphoid tract in the larynx areas is accountable for the frequency with which retropharyngeal abscess occurs in very young children, then the scarcity of its occurrence as the age of the subject advances may also be conversely proven, for with adolescence and maturity, the lymphoid tissue which is so great a productive agency of hypertrophy or disease of any part of Waldeyer's ring greatly atrophies, and the pathology depending on this tissue is of necessity lessened.

The presence of these glands in infancy and early childhood, and their disappearance *during* childhood, are problems yet to be solved by physiologists. It is easy to agree with Goldstein in the conclusion that these nodes are intimately associated with the adenoid vegetation, the life cycle of which runs in quite a remarkable parallel with the activity of the retropharyngeals.

I, myself, am of the opinion that these lymph nodes in early life are among the chief filters of efferent vessels from the adenoid growths, acting as such while the lymphoid structure of the adenoids is functioning at the peak of its physiologic activity. When this ultimate stage of usefulness has passed, and atrophic degeneration of the glandular substance of the adenoids takes place, it is probable that the sphere of utility of the retropharyngeal glands has also passed, and that they are gradually destroyed by a chronic progressive fibrosis and degeneration. To this hypothesis may be added a suggestion that the entire mechanism may at some future time be shown to be a legacy from some early period in the developmental history of the human species.

SYMPTOMS

The development of a retropharyngeal abscess in the adult is heralded by a number of well marked indicative signs, calling attention at the onset to the existence of some morbid process in the throat. The symptomatology parallels that of quinsy, with the exception that the course of the former is more prolonged and the pain less agonizing.

In infants and young children, the diagnosis of the condition presents some difficulties to the general practitioner, and at times also to the pediatrician and laryngologist. The inflammatory process, which eventually becomes the abscess, sets in insidiously, and, by the character of its onset, may put the unwary off the proper diagnostic trail. It is the experience of most pediatricians that the symptoms are often not sufficiently prominent to attract attention until the local process has increased to such an extent that it interferes to a greater or a less degree with respiration, deglutition, or both. The variations in symptoms in different cases are due to two principal factors: the location of the abscess, and the extent of it. If the tumefaction is situated high in the pharynx wall, respiration is not interfered with; there is, however, a difficulty in deglutition, and a nasal intonation is noticeable in the voice. If the swelling is lower in the throat, respiratory symptoms become more prominent. Symington showed some years ago that, though the neck as a whole is relatively longer in children than it

20. Heiman, Henry: The Effect of Subcutaneous Injections of Magnesium Sulphate in Chorea, Am. J. Dis. Child. **12**: 109 (Aug.) 1916.
21. Ripley: Arch. Pediat. **1**: 184.
22. Richards: Lancet **2**: 659.
23. Mercier, cited by Bosworth: Dis. Nose and Throat **2**: 76.
24. Taptas: Gaz. méd. d'Orient., 1905, p. 74.
25. Goldstein: Laryngoscope **18**: 46, 1908.

is in adults, the larynx in infancy is fully one vertebra higher in position. Encroachment, therefore, and interference with the respiratory function are relatively more possible in the child than in an adult.

In addition to these signs, there are a number of symptoms which vary in constancy and prominence in individual cases. Bokai was impressed with the position of the head as a valuable diagnostic sign. He observed that when the abscess occurs laterally (which is the case in a majority of instances), the head may be drawn toward the healthy side and held with some degree of rigidity in this position. Other writers quote Reigenier's term "cri de canard," in describing the throaty quack one hears more frequently in quinsy.

Dyspnea becomes a prominent symptom, in most cases, some time in the course of the disease, owing to forward pressure on, or lateral displacement of, the larynx, and this pressure earlier in the course of the affection is responsible for the frequently noted irritative cough, which later simulates a croup.

There are on record a number of unusual cases displaying symptoms of more remote origin. Winslow [26] has reported an instance of retropharyngeal abscess situated high in the pharynx, in which the history and signs indicated adenoids. In a case published by Thompson,[27] the first and practically only symptom was due to a paralysis of the esophagus. (This patient, an adult, showed a subadenoid abscess.) A patient of Spingarn's [28] exhibited definite symptoms of pressure on the vagus trunk.

In an illness of early childhood, involving difficulty in respiration or deglutition, whether acute or insidious in onset, the retropharyngeal space must be regarded with suspicion, and an effort should be made to examine the pharynx walls thoroughly by palpation, as well as by inspection. The tumor mass may not be visible to the eye in the brief interval of inspection, owing, in some cases, to its hidden position; but usually to the struggling and gagging of the little patient. It is agreed by all writers on the subject that palpation offers a more satisfactory means of diagnosis, the extent, the location and the condition of the abscess being more readily determined, in the majority of cases, by a single diagnostic maneuver. The lateral and posterior walls must be investigated, it being already noted that the clinical retropharyngeal abscess may be a suppurative process in a lymph gland not a member of the true retropharyngeal group.

DIFFERENTIAL DIAGNOSIS

The differential diagnosis may at times offer some difficulties, judging by the experience of some writers, though in individual experience they rarely present themselves. For example, many years ago Duke reported a case of aneurysm of the common carotid which burrowed into the retropharyngeal space, and, mistaken for abscess, was opened, with disastrous result.

The history and a careful examination of the neck and spine will arouse a prompt suspicion, in cases of cervical Pott's disease, and the roentgen rays will confirm the diagnosis of cold abscess. A type of retropharyngeal abscess due to a nontuberculous spondylitis is far more difficult of diagnosis, and may remain unidentified until the usual treatment for the more common abscess has failed. This is an acute osteomyelitis of the vertebrae, which, when located anteriorly in one of the cervical segments of the spine, forms a burrowing abscess in the retropharyngeal region. Symes' report, in 1826, of a patient with caries of the cervical vertebrae, which healed on discharge of a sequestrum, is probably the first case of the kind on record. In our series, the case of one of my colleagues was such an instance, a sequestrum being found and removed by operation, with recovery. Nast-Kolb [29] has reported a few of these cases, and Kirmisson [30] has compiled a number of similar examples.

In one case, reported by Goldstein, the clinical picture was misleading, prompting the surgeon in charge to consider the possibility of malignant new growth. A section of tissue from the tumefaction was submitted for microscopic examination, and the pathologic report showed lymphosarcoma. In this case, the author, suspicious of retropharyngeal abscess, demonstrated pus with an aspirating trocar. Speedy and complete recovery followed operation. Bosworth reported a similar instance many years ago.

It must be remembered that infections of the upper respiratory tract may produce a lymphadenitis in the retropharyngeal nodes, without the formation of pus. It is logical to assume that these glands may become infected and enlarged as frequently as the more superficial glands of the neck, suppurating similarly to the latter in only a small proportion of the cases. Palpation demonstrates the swelling, which rarely attains sufficient size to cause symptoms. It should be borne in mind that the absence of fluctuation does not rule out abscess, nor does failure to locate a soft area. In many instances, the pus pocket is deeply buried behind the thickened indurated pharynx walls, making it sometimes impossible, in even fully developed abscess, to obtain fluctuation.

Occasionally, differentiation must be made between cases of abscess and those of acute pharyngitis in throats of patients with cervical scoliosis, this condition causing a unilateral projection of the posterior wall of the pharynx. A lateral twist of the cervical spine destroys the transversity of the back wall, and, in this oblique position, the forward mass may be confused with abscess, especially when the mucous membrane is inflamed though the absence of fluctuation, and the palpation of the vertebral bodies renders this mistake unlikely.

In articles written on this subject in recent years, the differential diagnosis between retropharyngeal and peritonsillar abscess receives little or no attention. It has been almost customary to state merely that the former never occurs after the age of 3 years, and that the latter never occurs prior to this time. I do not hold with this view, having had experience with two cases of frank quinsy in which postpharyngeal abscess was no more to be thought of than in adult cases. Both were opened in the usual way, with the usual recovery.

It is not possible to differentiate these cases by strict palpation, but primary inspection will lead to suspicion of this atypical position, the tonsil being displaced medianward instead of forward, and a peritonsillar bulging, with edema, being noted in the anterior pillar.

The early symptoms of postpharyngeal abscess are usually of too mild a degree to excite suspicion of the actual morbid process; it is only when the functions of

26. Winslow: Eye, Ear and Throat Diseases **7**: 57, 1902.
27. Thompson: Laryngoscope **21**: 1081.
28. Spingarn: Med. Rec. **78**: 529.
29. Nast-Kolb: Ergebn. d. Chir. u. Orthop. **3**: 386.
30. Kirmisson: Presse méd., 1909, No. 38.

respiration and deglutition are interfered with that the clinical picture presents a suspicious aspect.

The dyspnea may suggest a laryngeal affection. Combined with the croupy cough, it is often suspected as a diphtheria before a careful oral examination is made. I have seen cases strongly resembling a laryngeal stenosis due to foreign bodies; in a recent case, the house physician had ordered a roentgenogram of the larynx before my arrival at the bedside. Alexander,[31] Fedde [32] and other recent authors, in reporting series of these cases, lay special stress on the similarity between abscess and croup and laryngeal edema. Kyle [33] points out that gentle pressure backward on the larynx greatly decreases the dyspnea and cyanosis, in cases of abscess, but has little or no effect in croup diphtheria.

COMPLICATIONS

The complications arising from suppuration in the retropharyngeal lymph nodes are due to: (1) spread of the infecting process by blood and lymph streams, causing septicemia, pyemia or distant infections, such as meningitis; (2) spread of the process by continuity, producing spontaneous and serious hemorrhage by infectious erosion of the large vessels of the neck, and by spreading or burrowing of the abscess downward, involving the mediastinum, or by rupturing into the esophagus; or (3) some mechanical process, such as pressure of the tumefaction forward on the epiglottis and larynx, with edema and air hunger sufficient to require emergency tracheotomy; or such as spontaneous or artificial rupture of the abscess, with aspiration of the infected content, producing pneumonia, lung abscess or sudden asphyxia.

Many of these complications were recorded in the early literature of the subject soon after the recognition of the condition as a clinical entity. Bokai, Schmitz and Carmichael, on the continent, and Lidell, in this country, are on record with serious and fatal cases in the seventies. Lidell,[34] Bokai, Carmichael [35] and, more recently, Wylie and Wingrave,[36] Travers [37] and others, reported fatal hemorrhage from the carotid arteries. Justi and Gaupp are on record with cases of sudden suffocation through spontaneous rupture of the abscess. Schmitz's patient died of edema of the glottis. One of Spingarn's [28] cases is typical of the septicopyemia group of complications, and less than two years ago Mosher [38] published a report of jugular thrombosis following a retropharyngeal abscess. Szmurlo [39] has reported the spontaneous rupture of the abscess intracranially, through the internal auditory canal.

Of my own patients, two died of hemorrhage despite efforts at ligating, following the opening of the abscess. There were three other deaths in the series; in one, the condition became complicated by pyemia, in the other two by bronchopneumonia and lobar pneumonia.

TREATMENT

For fifty years, the question of opening retropharyngeal abscesses through the mouth or of draining them externally has caused some dispute, and, at the present time, there is still some difference of opinion. Chiene [40] and Burkhardt,[41] in 1877 and 1888, respectively, advocated opening the abscess through the neck, the former, along the posterior edge of the sternocleidomastoid muscle, the latter, along the anterior edge. At that time, Chiene's approach was considered advantageous, because it is further removed from the large vessels, and is thus less liable to cause erosion, and serious or fatal hemorrhage, if the drainage is long continued. Trelate, in 1882, accomplished external drainage by operating through the mouth, and pushing through the abscess from the pharynx to the neck. At the same period, the instrument of Fleming and the pharyngotomes of Schmitz and Stoerk were also popular. Abelin of Stockholm, in 1871, recommended that the abscess be opened with a trocar, with the view of avoiding the danger of pus flowing into the larynx; while Niemeyer recommended the use of the finger nail. During the last decade of the nineteenth century, the bistoury, sometimes guarded with gauze or adhesive, was more universally used, and with many operators it is still the method of choice. Schmidt,[42] Myer,[43] Mierhof,[44] Lilienthal,[45] Dean [46] and a number of other writers have contributed to the problem more recently. Schmidt, Myer, Pierson and Dean favor external drainage. Pierson operates externally behind the sternocleidomastoid. Dean's report, one of the most recent on the subject, advocates operation in cases of tuberculous caries; but he regards it as so simple and safe a procedure that he recommends it for the acute abscesses. Dean uses the Burkhardt incision, through skin, platysma and vaginal fascia, following which the finger is inserted between the vascular and visceral fascial sheaths, along the prevertebral fascia, into the retropharyngeal space.

We have been accustomed at our center, for a great many years, to open these abscesses when convinced of their acute nature, after the manner described by Mierhof, in 1905. This operation consists in inserting the index finger of the left hand into the child's mouth, using a gag in older children, to locate fluctuation or the most pronounced area of pointing. With the finger maintained in this position, an artery snap without teeth, somewhat curved and moderately pointed, is introduced closed into the mouth along the inserted finger, and is directed by the latter to the point of election. The hemostat is pushed quickly into the body of the abscess and withdrawn with the blades widely opened.

There has been considerable discussion recorded in the literature regarding the position of the patient during the mouth operation—suggestions being offered for every conceivable posture, in an effort to diminish the likelihood of pus being aspirated into the trachea. Mierhof opened the abscess with dressing forceps, having the child held in an upright position on the knee of an assistant, who, as the abscess was opened, threw the patient's head and body forward.

Our method has been to wrap the child in sheet or blanket, with the arms at the side of the body and legs extended, this procedure minimizing the struggle and permitting a single assistant to have perfect control of the child. The swathed patient is laid flat on the table,

31. Alexander: New York M. J. **98**: 227.
32. Fedde: Med. Rec. **86**: 1009.
33. Kyle: Diseases of the Nose and Throat, p. 548.
34. Lidell: Am. J. M. Sc., 1883, p. 321.
35. Carmicheal: Edinburgh M. J., 1881, p. 24.
36. Wylie and Wingrave. Lancet **1**: 1042, 1906.
37. Travers: Brit. M. J. **2**: 703, 1902.
38. Mosher: Tr. Am. Laryngol., Rhinol. & Otol. Soc., 1920, p. 327.
39. Szmurlo: Gaz. lek. Warszawa **24**: 454.
40. Chiene: Brit. M. J., 1877.
41. Burkhardt: Zentralbl. f. Chir., 1888, p. 57.
42. Schmidt, W.: Ztschr. f. Chir. **55**: 129.
43. Myer: Am. Med. Surg. Bull. **9**: 454.
44. Mierhof: Laryngoscope **15**: 467.
45. Lilienthal: M. Times **41**: 355.
46. Dean: Ann. Otol., Rhinol. & Laryngol. **38**: 566.

with head turned toward the operator, and the moment the abscess is opened, is turned quickly on its stomach, with the body elevated somewhat above the level of the head.

This method has proved very successful in my experience, and I remember only an occasional instance in which reopening of the abscess on account of insufficient drainage has been necessary.

104 South Michigan Avenue.

ABSTRACT OF DISCUSSION

Dr. Robert Sonnenschein, Chicago: There are only two points I want to touch on: an anatomic and pathologic consideration—the course of the pus, depending on the location of the infection. In the acute case, as pointed out by Dr. Frank, the abscess forms from the breaking down of the retropharyngeal glands. As a rule, the pus burrows directly beneath the mucosa of the pharynx and usually points into the pharynx. Those cases are the most favorable ones, and rarely do serious results follow. In the second variety, when the pus comes from disease of the bodies of the vertebrae, the pus burrows down behind the scalenus muscles, and, unless recognized early, usually descends into the posterior mediastinum and causes death. We should make careful examination of the pharynx in young children with a temperature curve which is otherwise unaccounted for. On superficial examination in many of these cases there is apparently no swelling of the pharynx; and yet if the space just back of the tonsils is examined closely, infection is found to account for the rise of temperature, and if not arrested early may cause serious difficulties.

Dr. Cullen F. Welty, San Francisco: A girl, aged 5 years, complained of pain and discomfort for a few days. There was a swelling in the region of the tonsil that had been removed. It looked and felt as if an abscess was located beneath the tonsillar fossa. Under general anesthesia a small incision was made in the posterior pillar. Pus was there under considerable pressure. It was cared for very nicely, as we care for bleeding following a tonsil operation. As the pressure was relieved, the incision was enlarged and the same procedure repeated until all the pus was evacuated. Afterward the cavity was packed with gauze an inch wide and a yard long. The packing was removed the following day and a tight packing inserted daily until the cavity was obliterated. A number of patients have suffocated from the pus escaping too rapidly, and by doing the operation in this way there is no possible chance for such a complication to develop.

Dr. H. W. Lyman, St. Louis: I have seen three cases of retropharyngeal abscess in adults. The most interesting occurred in an acute exacerbation of chronic mastoiditis. When the patient was placed on the table for a mastoid operation, the discharge, which previously had been very scanty, was seen to be quite profuse. The canal was filled with pus. This was sponged away and more pus welled up from the middle ear cavity. After the operation was performed, the conditions found did not account for this free discharge of pus. The mastoid pain was relieved, but the patient did not get along as well as I had hoped. An examination of the throat was, of course, made, and there was some argument as to whether or not there was a pathologic condition in the throat. Eventually, a slight swelling in the posterior pharyngeal wall just above the eustachian tube was opened, and a free discharge of pus from a retropharyngeal abscess occurred. From that time on the recovery was uneventful. Careful study of the case convinced us that the infection had occurred along the lymphatics around the eustachian tube. Another case occurred after a mastoid operation. The patient came in with acute mastoiditis and with the posterior cervical glands indurated and enlarged. After operation the bony part of the wound healed, but a retropharyngeal abscess developed. It was opened, and pus could be expressed not only from the retropharyngeal abscess, but also from the broken down posterior cervical glands, which were the source of infection in this case. The third case occurred in a man who was brought into the hospital for some alcoholic condition and was removed the next day for the reason that he was opposed to any medical treatment. A retropharyngeal abscess had opened spontaneously and was discharging huge amounts of pus. Examination disclosed that it had already extended to the mediastinum. The man died soon afterward of sepsis. Unless the roentgenogram reveals a pathologic condition of the cervical vertebrae, the method of opening through the mouth is preferable. One point should be strongly emphasized—that is, the danger of general anesthesia in operating for retropharyngeal abscesses. Several fatalities have been reported. One should never use a general anesthetic in this condition. In the case of children, simply wrap the patient in a sheet and have an assistant hold him with the head hanging down. The pus then runs out the nose, and there has never been any aspiration of pus in cases so treated.

Dr. John A. Pratt, Minneapolis: I, too, have seen three adult cases of postpharyngeal abscess, and they occurred within a period of three weeks: One patient, a man, aged 30, was a syphilitic; the second, a girl, aged 16, had had a tonsillectomy previously, and the third case, in a woman, aged 45, also followed a tonsillectomy.

Dr. E. L. Myers, St. Louis: I have had six cases of retropharyngeal abscess. Two were in babies, one of which was diagnosed before operation; the other was undiagnosed, and operation was performed for adenoids. On palpation we were surprised to find evidences of pus. The child recovered. Two cases occurred at the age of puberty. A child of 14 came in for torticollis with a growth similar to sarcoma in the nasopharynx, and I opened it with hesitancy. He apparently recovered, but six months later died of general tuberculosis. In another case the complaint was a torticollis, with retropharyngeal abscess, and in another case the torticollis presented itself first. On going into the history of the latter case we found that the man had had otitis purulenta chronica. He refused mastoid operation; later the mastoid drained through a retropharyngeal abscess. This was four years ago, and the patient is now apparently well. The abscess drained into the right lateral pharynx. The remaining case was that of a man who came in for an extreme torticollis. I did a mastoid operation and found that I was dealing with a digastric mastoid abscess. The pus was entirely digastric, and four or five days later the patient complained of difficulty in swallowing. I then drained the balance of the mastoid pus through the pharynx.

Dr. Joseph C. Beck, Chicago: Did you find in these cases that the action of the constrictor muscles has anything to do with mechanically forcing the pus one way or the other? Why not resort to the use of suction while you are operating to get the pus out?

Dr. William B. Chamberlin, Cleveland: I should like to report one unfortunate experience in this condition. A child not over 3 years old was brought into the dispensary. In demonstrating this case to one or two students I put in an ordinary mouth gag, when suddenly the child stopped breathing. All possible efforts to resuscitate the child were made, but were unsuccessful. I think the abscess was pressing on the larynx, as a large amount of pus drained out on incision. Facilities were not immediately available for the introduction of a tracheotomy tube or for intubation, and the child died. Possibly this suggests the danger that might result from demonstrating these patients to students, especially with the use of the gag.

Dr. Ira Frank, Chicago: In regard to Dr. Beck's questions, the first one I cannot answer. As to the employment of suction in these cases, I found nothing in the literature on this point. We have always found the operation such a short one and done so quickly that we have looked upon the use of suction as superfluous. Regarding anesthesia, we have never given a general anesthetic to any of these children. I have brought nothing new to your attention, except, perhaps, the possibility of these abscesses being overlooked in routine examination. When we can exclude a foreign body in an illness of early childhood involving difficulty of respiration and swallowing, I feel that the retropharyngeal space should be regarded with suspicion.

FUNDAMENTAL FACTORS IN THE CONTROL OF TUBERCULOSIS

WITH ESPECIAL REFERENCE TO THE SANATORIUM *

HENRY BOSWELL, M.D.
SANATORIUM, MISS.

In presenting a paper on the subject of tuberculosis, I offer my apologies for repetition of papers on the same subject written in the past several years. However, as tuberculosis is a preventable disease, so classed at least, no public health program would perhaps be complete without something being said with reference to this, the most common of all known diseases, especially since it produces the greatest number of deaths of all preventable diseases of history.

For several years, the fight has been waged in many instances against the disease alone, rather than as a broad public health movement. Within the last few years, in Mississippi, we have attempted to start a campaign, the foundation of which is laid upon a broad vision of the tremendous fight before us, and our law is so framed in its conception of the educational and curative work that we are able to launch a campaign commensurate with the immensity of the problem. In this, we took into consideration the fact that science regards this disease as preventable, and that we know less about tuberculosis than almost any other disease known and classed as preventable. We recognize this disease as one of peculiar significance, in that it is not quarantinable nor will it be for many years, if ever, as public sentiment is always necessary to a successful quarantine. We likewise took into consideration the fact that any campaign against tuberculosis must, in addition to fighting the disease as an entity, be properly linked with a broad public health movement, as we believe that, in a great percentage of cases perhaps, this disease is a by-product of circumstances, social conditions, and other diseases. It is true also that a great number of people are carriers of tuberculosis, though not having the active disease themselves. In fact, where examinations have been carried out scientifically, about 10 per cent. of people showing tubercule bacilli in the sputum are classed as having inactive cases; yet they furnish a constant source of infection.

FACTORS IN A SUCCESSFUL CAMPAIGN

With these facts before us, it seems self-evident that a successful campaign against a disease of this type must be one built on a broad basis and anticipating an enormous expenditure of money over a long period of years. With this in view, our ideas of a successful campaign are well exemplified in our law, which, in many respects, is similar to the laws of other states in the Union, in that a campaign must be linked with the state or municipal health department, as one of its bureaus, and that it must be coordinated with all public health movements, and in many instances be subservient to other bureaus, and with all private or charitable institutions, social welfare organizations, volunteer agencies and the Bureau of Animal Husbandry.

A successful campaign must be launched, first, through the educational department, which has for its object the education of the public to the prevalence and the infectiousness of the disease, instructing them constantly in everything modern science is able to give us; the employment of physicians and public health nurses (not special tuberculosis nurses), the organization of local agencies, particularly local health departments, both county and municipal, whose duty it is to deal with local communities; the improvement of health conditions, in order to control that part of the morbidity rate which is, or should be, classed as "end-products," and the dissemination of information to the public as to the general program, in order to hold their confidence, and insure their cooperation, which is the only method of securing monies in sufficient sums to insure success.

Secondly, attention must be given the other division, which may be termed that of the sanatorium. This division serves both for treatment and for educational purposes. It is undoubtedly true that the public demands care for the sick before they are willing to contribute liberally to prevention of disease. This unfortunately is a characteristic of the American people, and, when properly appreciated, returns to the health department and the organized campaign dividends in the form of cooperation and money for the final work. The sanatorium may be compared to our school systems in that, if properly handled, it becomes a school for the education of a large tuberculous population and sends back into the communities over the state or municipality a properly trained individual, who is potentially a carrier of the infection. This tuberculous population, receiving a general health education, and a broader conception of the beauties of health, and of the value of the physically perfect people, will return to their respective communities with an influence for good and for the up-building of the general health conditions, far greater than that of the average paid employee; for the patients command a degree of respect and confidence from their people to a degree that it would take years of work for a trained employee of the bureau of tuberculosis or the state board of health to secure. This alone will finally be a powerful factor in the eradication of the disease. If properly conducted it is a connecting link between the health department and the people. It is said by some who are perhaps better informed than I, that nurses sent out over a community could educate the people in the same way, that a sanatorium might better be dispensed with, and that the large sums of money would hasten the eradication of the disease when insuring a greater number of workers over a given area. This argument might be advanced against our school system. In order to secure a cheaper education we might send teachers to the various homes to educate the children, instead of using the tremendous sums of money for the erection of school buildings. I dare say that there are few who would be willing to concede this, and yet the education of a human being along the lines of health demands the same care and expenditure of money that a child does in reaching that stage of educational enlightment necessary to a progressive civilization.

INFLUENCE OF THE SANATORIUM

In the sanatorium, we are enabled, if the institution is of sufficient size and properly equipped, to teach a large tuberculous population such scientific facts as are known and to get it to them as a college training. That general public health work will reduce the morbidity rate in a given community, without regard to the fight against it as a definite entity, is amply proved. But it is also known that through this work we are bringing up a population of nonimmunes, to be later

* Read before the Section on Preventive Medicine and Public Health at the Seventy-Second Annual Session of the American Medical Association, Boston, June, 1921.

exposed to the uneducated carriers who are apparently healthy people, doing the work of the average citizen, and who will be responsible in later years, as is believed to have occurred in certain communities, of increasing mortality from this disease. This will undoubtedly be true if the present system of handling tuberculosis is continued. For instance, we are fighting to protect the young against exposure to the disease for the very good reason that perhaps most of the infections occur in early life. Yet, if they are protected until they reach adult life, and then become exposed to the uneducated carrier population as nonimmune, they fall victims to the disease in its most acute form, and will in the end cause an increased mortality. With a properly organized campaign, it is possible to find the carriers, to get them into the institution for an education, and to turn them back so instructed that, in the main, it will be safe for a nonimmune population to live with them.

In the treatment of the sanatorium as a part of the campaign, I would suggest the need of a home for the indigent incurables, most of whom are carriers over a number of years and, regardless of their education in the institution for curable cases, they are unable from a financial standpoint, unless protected by the state or local government, to carry out those things necessary to the protection of the general public.

SUMMARY

1. Tuberculosis is a preventable disease.
2. A certain percentage of people are carriers of the disease.
3. The campaign is one of education and not of quarantine.
4. It must extend over a long period of time and be on a big scale.
5. It must take cognizance of the fact that as the disease decreases, the fight must be more carefully made, because our race becomes one of nonimmunes.
6. It will require constantly increasing sums of money, which must be secured from the public.
7. It can be secured only by keeping in touch with the people, to insure their cooperation. To do this the workers must not travel too far ahead of public sentiment, nor forget public ideals.
8. No campaign can be successful unless it is a part of a general health movement, coordinated with the various bureaus of the health department, subservient to the general health movement, and coordinated, further, with all welfare agencies and the Bureau of Animal Husbandry.
9. The educational system must include the extension department of the bureau, keeping in touch with the tuberculous population, presented to them in their own language, catering to their ideals, and to local and sectional peculiarities.
10. The sanatorium is the fountain head from which all this should work and through which public sentiment for the final work may be crystallized. The sanatorium is a failure, as far as the prevention of the disease is concerned, unless it is operated as an educational institution rather than as a hospital.
11. A place must be had where the indigent tuberculous population may be cared for during the remaining days of their lives, in order to protect an increasingly large number of the "nonimmune" race from the dangerous carrier.

ABSTRACT OF DISCUSSION

Dr. F. R. Love, Denver: We, in Colorado, are great believers in sanatoriums. The value from the educational standpoint is tremendous. We have realized that the education of people with tuberculosis has been neglected through the carelessness of the average physician in charge of the case. Sanatoriums are the quickest and most efficient means to train these people not only to maintain their own health but also to protect the health of others. We remember the dictates of fresh air, good food and rest as being most important in the cure of tuberculosis. I want to add to that the factor of altitude. Altitude does not affect the ordinary person, but it will affect any of you if you go from your customary pursuits, more or less sedentary, to any clear, dry stimulating atmosphere which excites you to enlarged activities. It has happened more than once that a person sent to Colorado to regain his health will run a race a mile above sea level when he would not do it here in Boston or New York. And what is the result? It is the race that causes acute dilatation of the heart, and not the altitude. Many patients sent to Colorado are sent home later to die. They are sent out there when it is evident that it is too late. Another cause of failure is the individual susceptibility to the disease. Third is the virulence of the secondary infection. People die generally of secondary infection, with the streptococcus and pneumococcus in particular.

Dr. Edward O. Otis, Boston: The tuberculosis dispensary is a great factor for disseminating instruction in regard to tuberculosis. There are, of course, dispensaries and dispensaries; but a well conducted dispensary with a nurse trained in tuberculosis work, or, better still, a social worker, is a great opportunity to promote the prevention of the spread of tuberculosis. Massachusetts has four sanatoriums, one of which has 300 patients and the others 150 or more, and one with 150 or more children. Massachusetts is spending on those sanatoriums over a million dollars annually. Our law requires that every city and county of more than 10,000 inhabitants shall establish a tuberculosis hospital for indigent consumptive individuals. One question I would like to ask the author, and that is in regard to immunization. Some scientific men maintain that we are all tuberculized. Germany, for example, before the war had the lowest death rate from tuberculosis of any country that I know of, and the cause of that fact is attributed to their complete tuberculization. The question is how many of us are immune, how many of us receive our infections during childhood. As to the carriers of tuberculosis, I believe there are well carriers of tubercle bacilli, people who do not feel sick and never consult a physician, and yet are carriers of bacilli. And, therefore, we can never wholly eliminate from the community the danger of infection from tuberculosis. And if we look on the matter in the way that some do, perhaps then we should regard tubercle bacilli as a friendly ally under the circumstances of our present civilization.

Dr. C. B. Wood, Monongahela, Pa.: For almost twenty years I have had charge of a tuberculosis dispensary in our county. I practice in one of the busiest industrial spots on earth. There are boarding houses with rooms about 14 by 16, containing seven beds, each bed doing double duty. The friends and relatives of these people are still coming over, bringing incipient cases. Congress has never had ten minutes to devote to the restriction of immigration, and by this neglect another torch is added to the tuberculosis conflagration. Unrestricted immigration is one of the strongest factors today in keeping tuberculosis in this country. Then, the lack of professional cooperation. For frequently you see newspapers on the floor, at the bedside, the rags and handkerchiefs. Not a word is said by the attending physician about keeping the flies out, or the use of a sputum cup. We have not had from the attending physician the cooperation which we should have had. Carelessness, on the part of the family, and a disregard of repeated warnings lead to spread of the disease in the same family. Quackery and advertising in newspapers help to keep it going, and then there are the religious and quack health journals.

Dr. Henry Boswell, Sanatorium, Miss.: There may be merit in altitude, we don't know—the fellow at the bottom

of the hill says "No," the fellow at the top of the hill says "Yes"; but we are lacking in scientific information to prove either. Nobody knows positively whether altitude has any material effect one way or another in the treatment. The doctor very truthfully says that many patients go to Colorado and the West with a feeling of perfect confidence and freedom, but thoroughly ignorant of how to care for their own health and the health of others. In the last few years I have visited every state in the Union, and have heard the same story in every one. I have secured from every sanatorium in North America their reports in the last several years of their actual results of treatment. They were grouped into New England, North Atlantic states, Middle Atlantic, Southern Atlantic, Southern, Middle Western, Western and Southwestern states. The incipient cases showed the same general average, and down through each category there was but little change in the percentage. In the moderately advanced cases there is a small percentage in favor of the Southwest, and in the advanced cases the average was 13 per cent. in the Southwest, and I believe that the advantage comes from the psychologic effect of the man living in other states and going up in the mountains in the belief that he will get well, and he does. I don't believe that a home for incurables is a sound undertaking with a population of less than 40,000. The preventoriums for children constitute an important part of our work, and I hope the result of this discussion will be that we may study the subject and will do some investigation looking to the further and more scientific treatment of tuberculosis.

Clinical Notes, Suggestions, and New Instruments

CASE OF MASSIVE TUBERCULOUS KIDNEY

S. W. SAPPINGTON, M.D., PHILADELPHIA

While the tuberculous kidney is sometimes small, it is usually considerably enlarged and occasionally forms a huge mass completely filling one side of the abdomen. Of the last instance, the case here reported is illustrative.

REPORT OF CASE

History.—R. W., aged 41, negro, single, cook, was admitted to the Hahnemann Hospital, May 2, 1921, complaining of swelling of the abdomen. His past history included a doubtful chancre at 20, pulmonary tuberculosis at 21, and paraplegia at 22. The patient stated that the chancre was followed by inflammation of the bladder with milky urine and heavy mucus which has persisted to date. The pulmonary tuberculosis, which began with hemoptysis, incapacitated him for only a short time. The paraplegia in the form of a flaccid paralysis also disappeared. He had perineal abscesses in 1912 and 1916. In 1916, he first noticed a small lump in the right side of the abdomen. This painless mass slowly but steadily increased in size up to the present time.

Examination revealed a large, firm mass, flat on percussion, filling the right side of the abdomen. A small amount of fluid was detected in the peritoneal cavity. The size and position of the liver and spleen were normal. The heart was negative. There were râles at the right apex. There was marked kyphosis. To the left of the median raphe of the perineum was a urinary fistula. The average temperature was normal morning, rising to 101 F. in the evening. There was moderate anemia, the last blood report reading: hemoglobin, 40 per cent; red cells, 3,280,000; white cells, 15,100. The Wassermann reaction was negative. The sputum contained tubercle bacilli. Urinalysis revealed: 1,750 c.c.; alkaline; specific gravity, 1.028; albumin, bare trace; considerable pus. The phenolsulphonephthalein test was: first hour, 21; second hour, 15; total, 36. The cystoscopist reported: "Bladder capacity normal. Ulcerated areas worse on the right side near the ureter. Left ureter catheterized; right could not be located. Indigocarmin test shows right kidney not functioning."

The rapid increase of peritoneal fluid necessitated its removal, and about 4 liters of clear fluid were evacuated. A few days later, the weakened patient died.

Necropsy.—This was performed, June 5, thirty-six hours after death. The body was emaciated. The pleural layers were entirely free on the left and completely adherent on the right side. The left lung was negative; the right lung showed a quite small fibrocaseous lesion at the apex. The heart was not examined. There were few or no glandular enlargements in the mediastinum. There was a chronic peritonitis with numerous firm adhesions, especially on the right side where the intestines were tightly bound to each other and to the tumor mass. There was no specific evidence of tuberculosis in the peritoneum, such as tubercles or caseation. The liver was negative. The spleen was slightly enlarged and firm, but showed no tubercles. The pancreas was negative. There was no peripancreatic glandular enlargements. The stomach presented no important change. The intestines, save for the adhesions just noted, were negative and gave no evidence of tuberculous involvement. The mesenteric and retroperitoneal glands were negative for gross tuberculosis.

Tuberculous kidney (at left) contrasted with one of normal size.

The right kidney formed a great tumor filling the entire right side of the abdomen from the liver to the pelvis. Removed with difficulty, the organ, which simply presented the appearance of a big kidney, was found to weigh 3,600 gm. It measured 33.5 cm. from pole to pole, and 17.8 cm. from cortex to pelvis. Section revealed the typical lesions of chronic, renal tuberculosis in a series of ragged, sacculated excavations filled with milky, caseous material. The left kidney was very moderately enlarged and congested, but gave no gross evidence of tuberculosis. The bladder wall was normal in thickness, and the mucosa showed only a few ulcerations.

COMMENT

The illustration presents in contrast the tuberculous organ and a kidney of normal size. The diseased kidney was in reality larger, as some of the fluid content had escaped before the photograph was taken. The weight, 3,600 gm., is twenty times that of a normal kidney and about twice the weight of a normal liver. A kidney of this size is exceptional but not, of course, unique. A limited search of the literature for similar cases was disappointing, only vague or indefinite statements of enlargement being found instead of exact figures. Between Jan. 1, 1894, and Jan. 1, 1918, 85,000 patients were operated on at the Mayo Clinic, 532 of these for renal

tuberculosis.[1] This encouraged us to write to Dr. Braasch for information. He replied in part: "In regard to tuberculosis of the kidney, we have no exact statistics as to the size of the largest kidney which we have removed, but I recall very well one which we removed some two years ago which was the size of a watermelon."

The relative immunity exhibited by patients with renal tuberculosis is noteworthy. With many opportunities for multiple or general infection, the subject's high resistance tends to prohibit, heal or limit foci in and out of the kidney. This is well illustrated in the present case. The renal lesion was evidently of the type of so-called occluded tuberculosis with early stricture of the ureter and ultimate autonephrectomy. The duration was certainly five years and, from the history, not improbably ten or twenty years. At the end, the massive wreck of the kidney was the only impressive lesion. The other kidney was grossly free, the bladder involvement was almost trivial, the spondylitis was healed, liver and spleen were negative, the lung lesion was surprisingly small and limited, glandular enlargements were not in evidence, there was no intestinal tuberculosis, and the peritoneal effusion was a terminal affair.

1327 Spruce Street.

SMOKING IN PULMONARY TUBERCULOSIS

E. A. DUNCAN, M.D., EL PASO, TEXAS

There is a notable lack of uniformity in the practice of physicians treating tuberculosis in regard to their instructions to patients as to smoking. Some physicians discourage or even prohibit the use of tobacco; others permit smoking in great moderation with instructions not to inhale; some are little or not at all interested in whether their patients smoke or not, perhaps saying, perfunctorily, that they are better off without it, and so dismissing the subject. Fishberg[1] states that "smoking has no effect on the tuberculous process in the lungs." Krause[2] does not believe that chronic inflammatory conditions favor bacterial infection. Webb[3] concluded from a statistical study of soldiers that smoking does not predispose to tuberculosis. Duboff[4] found tuberculous throat complications no more frequent in smokers than in nonsmokers. Cornet[5] states that consumptives are allowed to smoke moderately, provided they have no throat symptoms. On the other hand, Wittich[6] believes that the use of tobacco cannot have any but hurtful effects on the patient. Brown[7] states that "it is far better for every patient to stop, for a time, all tobacco if he possibly can." Pottenger[8] believes that "tobacco does the patient no good and some harm, therefore should not be used." It seems that the writers who have discussed this subject have had in mind largely the possibilities of damage to the tuberculous lung by local irritation. There is, however, another side to the question which has been neglected; namely, the circulatory stimulation of tobacco which to some patients is decidedly disadvantageous.

My attention to the possibilities of untoward effects of smoking in pulmonary tuberculosis was called by a highly intelligent patient who stated that smoking caused his temperature to rise. Investigation verified his assertion. This patient was a man with a minimal degree of lung involvement, well nourished and in good general condition. But in spite of ideal conditions he had had for some months a pulse rate of from 90 to 100 and an afternoon rise of temperature to 99.3 or 99.5. He was a moderate cigaret smoker. Investigation showed that his pulse rate remained at from 70 to 76 until he had had his after-breakfast cigaret, after which it promptly rose to from 90 to 100 to remain at that level throughout the day. If this patient abstained from smoking, his pulse rate continued at from 70 to 80 and no rise in temperature occurred. This reaction could be provoked at will. I have since made similar observations in other patients.

The mechanism of this phenomenon is based on the well known fact that in habitual smokers tobacco increases pulse rate and, to a certain extent, the blood pressure. As a result of this circulatory stimulation, there occurs an increase in the movement of the blood which is shared by the pulmonary circulation. In this respect, the effect of smoking is analogous to that of exercise. It is obvious that this increased flow of blood through the lungs can only favor the access of toxins to the circulation, certainly undesirable if sufficient to cause a rise in temperature. It is also evident from the foregoing that smoking should be stopped by those patients with bloody expectoration or recurrent hemorrhages.

This effect of tobacco does not occur in every individual. Some patients may smoke without ill effect; but in any case in which the question arises whether or not smoking is inadvisable, decision can be made only by observation of the effect of tobacco on that particular individual. In other words, the effect of smoking deserves investigation in every case.

610 Martin Building.

1. Braasch, W. F.: Surgical Renal Tuberculosis: The Prognosis, Am. J. M. Sc. **159**: 8 (Jan.) 1920.
1. Fishberg: Pulmonary Tuberculosis, Philadelphia, Lea & Febiger, p. 559.
2. Krause, A. K.: Am. Rev. Tuberc. **2**: 63 (April) 1918.
3. Webb, quoted by Krause (Footnote 2).
4. Duboff, quoted by Fishberg (Footnote 1).
5. Cornet, in Nothnagel: Encyclopedia of Practice of Medicine.
6. Wittich: Information for the Tuberculous, St. Louis, C. V. Mosby Company, p. 91.
7. Brown: Rules for Recovery from Pulmonary Tuberculosis, Philadelphia, Lea & Febiger, p. 52.
8. Pottenger: Tuberculosis and How to Combat It, p. 246.

A CASE OF CHRONIC ACETANILIDISM

JOHN W. SHUMAN, M.D., SIOUX CITY, IOWA

A nurse, aged 28, complained of severe pain of two days' duration in the right mastoid region, requiring morphin for relief. She was deeply cyanotic. Her previous history was unimportant except for numerous operations since entering training six years prior. They were: "three tonsillectomies; three mastoidectomies (left); appendectomy; laparotomy (left); postoperative hemorrhage demanding a second operation for ligature, etc.; six weeks later the left abdomen was opened to explore the spleen; surgical infection of the left hand, wrist and forearm (streptococcus), necessitating three separate operations." Scars verified the main assertions. She denied taking any drug which might cause the color (cyanosis), but stated that this "was due to anemia, as her urine had been bloody since the kidney operation."

Surgical consultation ruled out any middle ear disease. Blood examination revealed: hemoglobin, 85 per cent.; leukocytes, 7,000. Differential count and chemical examination gave all findings within the normal limit. The urine contained many red blood cells; in fact, the color was chocolate brown. Following the statement of the ear surgeon that "the right ear was normal," the patient developed what appeared to be renal crisis (left), requiring morphin. It was noted, however, that she did not sweat during these attacks. Her temperature (axillary) ranged from 99.5 to 101.5 F. This, it was discovered, was due to an electric heating pad which was her constant companion; and she said that she chilled so that she could not trust a thermometer between her teeth. Later her temperature became normal, after the oral method was definitely instituted. Cystoscopic examination revealed healthy mucous membrane of the bladder wall, and urine collected from each ureter contained only an occasional red blood cell.

The patient had now been under hospital care for over two weeks. At about this time it was discovered that she had entered the hospital with 350 5-grain acetanilid tablets, and she admitted that she had been using acetanilid for more than three years.

She thoroughly deceived the staff of physicians (six) who had attended her for a period of more than two weeks. She presented symptoms which were baffling: (1) pain—a subjective symptom which cannot be measured; (2) hyperpyrexia (false); (3) hematuria (not constant, the source not determined, possibly menstrual). She was a malingerer and a drug addict. Had we tested the urine for anilin after noting her blue color, the hospital course might have been shortened.[1]

[COMMENT.—In connection with the foregoing report, read that of Dr. Nadler (THE JOURNAL, June 19, 1920, p. 1717). Dr. Shuman believes that it is the same patient.—ED.]

1. Cohn (Tests and Reagents, p. 336) gives this method: Extract urine with chloroform, evaporate and heat residue with mercurous nitrate. A green color develops if acetanilid is present.

MEDICAL EDUCATION IN THE UNITED STATES

ANNUAL PRESENTATION OF EDUCATIONAL DATA FOR 1921 BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

The tabulated statistics herewith presented are for the year ending June 30, 1921, and are based on reports received from the medical colleges and other reliable sources. We acknowledge here the splendid courtesy and cooperation of the officers of the colleges who have made the compilation of these complete statistics possible.

STATISTICS OF COLLEGES

Table 1, on pages 528-530, gives the colleges in session during 1920-1921; the population of the city; the rating given to the college by the Council on Medical Education and Hospitals; the number of students, men and women, registered during the year; the number of 1921 graduates, men and women; the number of graduates holding collegiate degrees; the number of teachers for each college; the number of weeks of actual work in the college year; the total fees for each year; the executive officer of the college, and the dates of beginning and ending of the next session. The figures in heavy-faced type show the totals by states. Beginning on page 547 are given essential facts concerning all medical colleges arranged by states.

HOME STATES OF MEDICAL STUDENTS

Table 2, on pages 532-533, shows from what state the students came who were in attendance at each medical college during the session of 1920-1921. The influence of the proximity of the medical school is seen in the fact that states having medical colleges contribute more students in proportion to the population than those which have no colleges. This is shown by the dark zone of figures running diagonally down the page. A comparison of this table with the large tables based on state board examinations,[1] which show the distribution of the alumni of each college, is interesting. The college that has widely distributed alumni usually has a student body from an equally large number of states.

The state furnishing the largest number of students this year was New York with 2,103. Illinois contributed 1,136 and Pennsylvania 1,050. The next states, in the order of the number of students contributed, are: Ohio, 781; Massachusetts, 699; Missouri, 615; California, 520; Michigan, 514, and Texas, 462. Two states had less than 10 each, these being Nevada, 7, and Wyoming, 6. There were 124 students from Hawaii, Porto Rico and the Philippine Islands, and 285 students from foreign countries.

NUMBERS OF STUDENTS BY CLASSES

In Table 3, on page 534, the student enrolled in each college are shown by classes. This permits one to see whether the attendance at each college is increasing or decreasing. The total attendance for the first year was 4,825 as compared with 4,234 last year and 3,104 in 1919. The second year attendance was 3,588, as compared with 2,837 last year, and 3,587 in 1919. The third year attendance was 2,637 as compared with 3,464 last year, and 3,272 in 1919. The enrolment of the fourth and fifth (intern) years, combined this year, is 3,822, as compared with 3,553 last year, and, 3,089 in 1919. The first, second and fourth (including the fifth) year class enrolments, therefore, show increases respectively, of 591, 751 and 269 over the enrolments in those classes last year. The third year class shows a decrease of 827 below that of last year which corresponds with the reduction shown a year ago in the enrolment in the second year class. This is the smaller class which entered medical schools in 1918, the War year. The increase in the total enrolment for the last two years indicates that readjustments under the higher entrance requirements have been completed.

TABLE 4.—MEDICAL COLLEGE ATTENDANCE

Year	Non-sectarian	Homeopathic	Eclectic	Physio-Med.	Nondescript	Total
1880.....	9,776	1,220	830	...	...	11,826
1890.....	13,521	1,164	719	...	...	15,404
1900.....	22,710	1,909	522	...	...	25,171
1901.....	23,846	1,683	664	80	144	26,417
1902.....	24,878	1,617	765	91	150	27,501
1903.....	24,930	1,498	848	149	190	27,615
1904.....	23,662	1,309	1,014	123	234	28,142
1905.....	24,119	1,104	578	114	232	26,147
1906.....	23,116	1,085	644	110	249	25,204
1907.....	22,303	1,039	545	97	292	24,276
1908.....	20,936	891	479	90	206	22,602
1909.....	20,554	899	413	52	227	22,145
1910.....	20,136	867	455	49	19	21,526
1911.....	18,414	890	433	49	...	19,786
1912.....	17,277	827	308	...	...	18,412
1913.....	15,919	850	256	...	...	17,015
1914.....	15,438	794	270	...	...	16,502
1915.....	13,914	736	241	...	...	14,891
1916.....	13,121	638	263	...	...	14,012
1917.....	12,925	589	250	...	...	13,764
1918.....	12,727	540	138	...	225	13,630
1919.....	12,259	397	86	...	310	13,052
1920.....	13,220	386	93	...	389	14,088
1921.....	14,033	440	98	...	301	14,872

NUMBER OF MEDICAL STUDENTS

The total number of medical students (Table 4) in the United States for the year ending June 30, 1921 excluding premedical, special and postgraduate students, was 14,872, an increase of 784 over last year. This is the largest enrolment of students since 1914. It is noteworthy (Table 12, page 535) that in the high grade (Class A) medical colleges both the number and the percenttage of students has increased. Of the total number of students, 14,033 (94.4 per cent.) were in attendance at the nonsectarian (regular) colleges, 440 (2.9 per cent.) at the homeopathic, 98 (0.7 per cent.) at the eclectic, and 301 (2.0 per cent.) were enrolled in three nondescript colleges.

(Continued on page 530)

1. THE JOURNAL A. M. A., State Board Number, April 30, 1921, pages 1232 to 1237, inclusive.

TABLE 1—STATISTICS OF MEDICAL COLLEGES IN THE UNITED STATES AND CANADA

Marginal Number	NAME AND LOCATION OF COLLEGE	Population of City where College is Located (1920 Census Reports)	Classification by Council on Medical Education	No. of Students Registered 1920-21		Graduates 1921		Grads. with A.B., B.S., or Ph.B.	Number of Teachers	College Year in Weeks	Total Fees (Dollars)				Executive Officer	Session of 1921-22		Marginal Number
				Men	Women	Men	Women				1st year	2d year	3d year	4th year		Begins 1921	Ends 1922	
	ALABAMA			**28**	...	...	...	...										
1	University of Alabama School of Medicine, University (Tuscaloosa)*	11,996	..	26	...	...	...	...	5	34	200	200	...	...	Clyde Brooks, M.D., Dean	Sept. 7	May 20	1
	ARKANSAS			**20**	**2**	...	...	...										
2	University of Arkansas Medical Department, Little Rock*	65,030	B	20	2	...	...	...	20	34	50	50	...	...	Morgan Smith, M.D., Dean	Sept. 19	June 7	2
	CALIFORNIA			**496**	**78**	**82**	**8**	**64**										
3	College of Medical Evangelists, Los Angeles	576,673	B	150	18	22	3	18	109	34	230	231	211	221	P. T. Magan, M.D., Dean	Aug. 28	May 9	3
4	College of Physicians and Surgeons, Los Angeles [1]	576,673	..	27	5	16	2	2	...	...	...	...	...	...	.....	.....	.....	4
5	Leland Stanford Junior University School of Med., San Francisco.	506,676	A	138	23	14	3	17	114	34	201	196	186	186	W. Ophüls, M.D., Dean	Oct. 1	June 17	5
6	University of California Medical School, San Francisco [2]	506,676	A	181	32	30	...	27	208	35	290	235	210	200	L. S. Schmitt, M.D., Secretary	Aug. 15	May 10	6
	COLORADO			**74**	**9**	**13**	**2**	**4**										
7	University of Colorado School of Medicine, Denver [2]	256,491	A	74	9	13	2	4	64	34	106	106	98	93	Charles N. Meader, M.D., Dean	Sept. 26	June 12	7
	CONNECTICUT			**112**	**7**	**15**	**1**	**12**										
8	Yale University School of Medicine, New Haven	162,519	A	112	7	15	1	12	107	35	305	300	300	310	Milton C. Winternitz, M.D., Dean	Sept. 29	June 21	8
	DISTRICT OF COLUMBIA			**405**	**12**	**78**	**1**	**49**										
9	Georgetown University School of Medicine, Washington	437,408	A	172	...	21	...	18	99	34	215	200	200	210	George M. Kober, M.D., Dean	Sept. 26	June 14	9
10	George Washington University Medical School, Washington	437,408	A	107	7	27	1	6	89	34	200	200	200	200	William C. Borden, M.D., Dean	Sept. 28	June 7	10
11	Howard University School of Medicine, Washington	437,408	A	126	5	30	...	25	39	33	165	155	155	162	Edward A. Balloch, M.D., Dean	Oct. 1	June 9	11
	GEORGIA			**294**	...	**59**	...	**23**										
12	Emory University School of Medicine, Atlanta	200,616	A	211	...	39	...	15	112	35	212	195	190	215	W. S. Elkins, M.D., Dean	Sept. 28	June 6	12
13	University of Georgia Medical Department, Augusta [2]	52,548	A	83	...	20	...	8	45	34	65	60	60	60	W. H. Dougherty, Jr., M.D., Dean	Sept. 15	May 31	13
	ILLINOIS			**1736**	**119**	**303**	**16**	**191**										
14	Chicago Medical School, Chicago [3]	2,701,705	C	88	...	25	...	...	77	...	180	175	175	205	.....	.....	.....	14
15	Hahnemann Medical College and Hospital of Chicago.—H.	2,701,705	B	66	2	11	...	7	90	34	166	162	176	192	J. C. Blake, Ph.D., Dean	Sept. 26	June 15	15
16	Loyola University School of Medicine, Chicago	2,701,705	A	228	16	63	7	5	126	34	165	165	165	185	Louis D. Moorhead, M.D., Dean	Oct. 1	June 15	16
17	Northwestern University Medical School, Chicago	2,701,705	A	432	...	78	...	51	172	33	225	220	216	210	Arthur I. Kendall, M.D., Dean	Oct. 4	June 10	17
18	Rush Medical College (University of Chicago)	2,701,705	A	621	82	123	9	127	250	34	230	225	235	235	John M. Dodson, M.D., Dean	Oct. 1	June 14	18
19	University of Illinois College of Medicine, Chicago	2,701,705	A	301	19	3	...	1	156	34	165	160	150	170	A. C. Eycleshymer, M.D., Dean	Sept. 26	June 14	19
	INDIANA			**241**	**10**	**57**	**3**	**55**										
20	Indiana University School of Medicine, Bloomington-Indianapolis	314,194	A	241	10	57	3	55	150	35	130	125	150	150	Charles P. Emerson, M.D., Dean	Sept. 12	June 7	20
	IOWA			**259**	**9**	**46**	...	**24**										
21	State University of Iowa College of Medicine, Iowa City [2]	11,267	A	259	9	46	...	24	62	33	160	150	150	160	Lee Wallace Dean, M.D., Dean	Sept. 26	June 6	21
	KANSAS			**128**	**6**	**27**	**2**	**17**										
22	University of Kansas School of Medicine, Lawrence-Rosedale [4] [2]	433,261	A	128	6	27	2	17	62	35	131	131	133	133	Mervin T. Sudler, M.D., Assoc. Dean	Sept. 12	June 7	22
	KENTUCKY			**172**	**6**	**48**	**1**	**12**										
23	University of Louisville Medical Department, Louisville	234,891	A	173	6	48	1	12	117	34	215	170	175	180	Henry Enos Tuley, M.D., Dean	Sept. 20	June 8	23
	LOUISIANA			**365**	**15**	**115**	**3**	**47**										
24	Tulane University of Louisiana School of Medicine, New Orleans	387,408	A	365	15	115	3	47	128	33	200	225	215	245	Lilian A. Collens, Secretary	Sept. 26	June 7	24
	MAINE			**65**	...	**8**	...	**3**										
25	Bowdoin Medical School, Brunswick-Portland [5]	258,288	A	65	...	8	...	3	...	...	...	...	...	...	.....	.....	.....	25
	MARYLAND			**552**	**62**	**147**	**16**	**103**										
26	Johns Hopkins University Medical Department, Baltimore	733,826	A	301	62	76	16	92	202	34	267	267	267	267	J. Whitridge Williams, M.D., Dean	Oct. 1	June 13	26
27	Univ. of Maryland Sch. of Med. and Coll. of P. & S., Baltimore	733,826	A	251	...	71	...	11	161	32	215	215	215	215	J. M. H. Rowland, M.D., Dean	Oct. 1	June 1	27
	MASSACHUSETTS			**1072**	**43**	**232**	**12**	**96**										
28	Boston University School of Medicine, Boston	748,060	A	109	13	9	4	7	81	33	200	200	200	230	John P. Sutherland, M.D., Dean	Oct. 6	June 19	28
29	College of Physicians and Surgeons, Boston [6]	748,060	C	28	4	6	1	...	34	...	125	150	120	125	.....	.....	.....	29
30	Harvard University Medical School, Boston	748,060	A	442	...	105	...	84	251	35	330	300	300	300	David L. Edsall, M.D., Dean	Sept. 26	June 22	30
31	Tufts College Medical School, Boston	748,060	A	372	26	73	7	4	135	35	236	221	211	216	Charles F. Painter, M.D., Dean	Sept. 19	June 14	31
32	Middlesex College of Medicine and Surgery, Cambridge.—N. [6]	109,694	C	121	...	39	...	1	52	...	150	150	150	150	.....	.....	.....	32
	MICHIGAN			**622**	**35**	**122**	**7**	**41**										
33	University of Michigan Medical School, Ann Arbor [2]	19,516	A	422	27	66	5	31	100	35	150	140	140	150	C. W. Edmunds, M.D., Asst. Dean	Sept. 27	June 19	33
34	University of Michigan Homeopathic Med. School, Ann Arbor.H. [2]	19,516	A	48	2	5	...	2	17	35	150	140	140	150	W. B. Hinsdale, M.D., Dean	Sept. 27	June 19	34
35	Detroit College of Medicine and Surgery, Detroit [7]	993,739	A	152	6	51	2	8	206	35	150	150	150	150	W. H. MacCraken, M.D., Dean	Sept. 26	June 17	35
	MINNESOTA			**359**	**25**	**51**	**2**	**53**										
36	University of Minnesota Medical School, Minneapolis	380,582	A	359	25	51	2	53	205	34	198	198	198	198	Elias P. Lyon, M.D., Dean	Sept. 28	June 14	36
	MISSISSIPPI			**46**	**3**	...	...	...										
37	University of Mississippi School of Medicine, Oxford*	2,150	A	46	3	...	...	...	17	34	133	133	...	...	W. S. Leathers, M.D., Dean	Sept. 14	May 30	37

	MISSOURI			**832**	**21**	**208**	**6**	**61**												
38	University of Missouri School of Medicine, Columbia * [2]	10,392	A	75	6	...	...	...	28	32	100	100	...	...	Guy L. Noyes, M.D., Dean	Aug. 29	April 26	38
39	Kansas City College of Medicine and Surgery, Kansas City.—N.[8]	433,261	..	90	...	12	2	...	32	...	200	200	200	200	.....	.....	.....	39
40	Kansas City Univ. of Physicians and Surgeons, Kansas City.—N.[4]	433,261	C	80	10	22	3	...	22	...	180	180	180	180	A. L. McKenzie, M.D., President	.....	.....	40
41	St. Louis College of Physicians and Surgeons, St. Louis [8]	773,000	C	120	...	65	...	...	30	...	150	150	150	150	.....	.....	.....	41
42	St. Louis University School of Medicine, St. Louis	773,000	A	284	...	65	...	32	138	32	250	250	250	250	Hanau W. Loeb, M.D., Dean	Oct. 1	June 1	42
43	Washington University School of Medicine, St. Louis	773,000	A	183	5	44	1	29	146	33	221	216	216	221	Nathaniel Allison, M.D., Dean	Sept. 22	June 8	43
	NEBRASKA			**302**	**10**	**71**	**1**	**27**										
44	Creighton University College of Medicine, Omaha	191,601	A	115	1	22	...	6	56	34	175	165	165	170	Hermann von W. Schulte, M.D., Dean	Sept. 21	June 3	44
45	University of Nebraska College of Medicine, Omaha	191,601	A	187	9	49	1	21	82	35	140	120	110	110	Irving S. Cutter, M.D., Dean	Sept. 14	June 4	45
	NEW HAMPSHIRE			**18**	...	...	...	...										
46	Dartmouth Medical School, Hanover *	1,551	A	18	...	...	...	...	12	35	250	250	...	...	John M. Gile, M.D., Dean	Sept. 22	June 20	46
	NEW YORK			**1824**	**138**	**551**	**23**	**203**										
47	Albany Medical College, Albany	113,344	A	87	5	17	...	2	64	35	245	240	210	205	Thomas Ordway, M.D., Dean	Sept. 19	June 12	47
48	University of Buffalo Medical Department, Buffalo	506,775	A	205	14	57	3	12	118	33	292	292	292	292	C. Sumner Jones, M.D., Dean	Sept. 26	June 9	48
49	Columbia University College of Phys. and Surgs., New York City	5,620,048	A	329	35	111	6	92	360	33	355	345	345	335	William Darrach, M.D., Dean	Sept. 28	June 7	49
50	Cornell University Medical College, New York City	5,620,048	A	188	40	41	*5	46	180	33	300	295	295	280	Walter L. Niles, M.D., Dean	Sept. 26	June 8	50
51	Fordham University School of Medicine, New York City [9]	5,620,048	A	66	...	65	...	9	...	...	...	...	...	...	.....	.....	.....	51
52	Long Island College Hospital, New York City-Brooklyn	5,620,048	A	264	12	80	1	5	132	32	356	350	350	380	Adam M. Miller, M.D., Dean	Sept. 26	May 31	52
53	New York Homeopathic Med. Coll. and Flower Hospital.—H.	5,620,048	B	120	10	36	5	1	61	35	270	270	270	270	R. F. Rabe, M.D., Dean	Sept. 15	June 10	53
54	University and Bellevue Hospital Medical College, New York City	5,620,048	A	410	18	114	...	17	189	35	320	320	320	345	Samuel A. Brown, M.D., Dean	Sept. 14	June 7	54
55	Syracuse University College of Medicine, Syracuse	171,717	A	155	4	30	3	19	113	35	267	267	267	277	John L. Heffron, M.D., Dean	Sept. 13	June 12	55
	NORTH CAROLINA			**121**	...	...	...	...										
56	University of North Carolina School of Medicine, Chapel Hill *	1,483	A	72	...	...	...	...	31	33	195	195	...	...	I. H. Manning, M.D., Dean	Sept. 29	June 14	56
57	Wake Forest College School of Medicine, Wake Forest *	1,425	A	49	...	...	...	...	15	34	200	200	...	...	Thurman D. Kitchin, M.D., Dean	Sept. 6	May 26	57
	NORTH DAKOTA			**38**	**1**	...	...	...										
58	Univ. of North Dakota School of Med., University (Grand Forks) *	14,010	A	38	1	...	...	...	15	35	85	85	...	...	H. E. French, M.D., Dean	Sept. 23	June 13	58
	OHIO			**670**	**38**	**162**	**14**	**114**										
59	Eclectic Medical College, Cincinnati.—E.	401,247	B	97	1	30	...	...	41	32	160	150	150	150	John K. Scudder, M.D., Dean	Sept. 15	May 15	59
60	University of Cincinnati College of Medicine	401,247	A	220	18	59	1	39	180	34	300	260	210	215	Henry Page, M.D., Dean	Oct. 3	June 17	60
61	Western Reserve University School of Medicine, Cleveland	796,836	A	147	5	36	9	45	129	34	285	260	254	255	Carl A. Hamann, M.D., Dean	Sept. 29	June 15	61
62	Ohio State University College of Medicine, Columbus [2]	237,031	A	172	8	27	4	28	90	35	152	152	152	152	Eugene F. McCampbell, M.D., Dean	Sept. 20	June 13	62
63	Ohio State University College of Homeo. Medicine, Columbus.—H.	237,031	B	34	6	9	...	2	15	35	152	152	152	152	Claude A. Burrett, M.D., Dean	Sept. 20	June 13	63
	OKLAHOMA			**98**	**5**	**15**	**2**	**13**										
64	University of Oklahoma School of Med., Norman-Oklahoma City	91,258	A	98	5	15	2	13	70	34	60	60	25	25	LeRoy Long, M.D., Dean	Sept. 19	June 6	64
	OREGON			**118**	**13**	**13**	**3**	**6**										
65	University of Oregon Medical School, Portland	258,288	A	118	13	13	3	6	81	32	165	160	160	160	Richard B. Dillehunt, M.D., Dean	Oct. 3	June 1	65
	PENNSYLVANIA			**1288**	**145**	**329**	**26**	**172**										
66	Hahnemann Medical College and Hospital of Philadelphia.—H.	1,823,779	A	152	...	49	...	6	97	32	245	245	245	245	William A. Pearson, M.D., Dean	Sept. 26	June 1	66
67	Jefferson Medical College of Philadelphia	1,823,779	A	514	...	114	...	63	175	34	330	325	325	325	Ross V. Patterson, M.D., Dean	Sept. 21	June 2	67
68	Temple University School of Medicine, Philadelphia	1,823,779	B	73	1	25	...	1	103	35	175	170	160	170	Frank C. Hammond, M.D., Dean	Sept. 19	June 15	68
69	University of Pennsylvania School of Medicine, Philadelphia	1,823,779	A	404	29	109	9	64	213	35	348	320	320	324	William Pepper, M.D., Dean	Sept. 30	June 21	69
70	Woman's Medical College of Pennsylvania, Philadelphia	1,823,779	A	....	103	...	15	9	66	33	198	202	200	182	Martha Tracy, M.D., Dean	Sept. 28	June 14	70
71	University of Pittsburgh School of Medicine, Pittsburgh	588,193	A	145	12	32	2	29	119	34	325	310	310	310	Raleigh R. Huggins, M.D., Dean	Sept. 26	June 14	71
	SOUTH CAROLINA			**76**	**4**	**10**	...	**6**										
72	Medical College of the State of South Carolina, Charleston	67,957	A	76	4	10	..	6	61	33	150	150	150	150	Robert Wilson, M.D., Dean	Sept. 22	June 1	72
	SOUTH DAKOTA			**32**	...	...	...	...										
73	University of South Dakota College of Medicine, Vermilion *	2,590	A	32	...	...	...	...	11	35	60	60	...	...	C. P. Lommen, M.D., Dean	Sept. 19	June 17	73
	TENNESSEE			**407**	**4**	**112**	...	**18**										
74	University of Tennessee College of Medicine, Memphis	162,351	A	54	1	26	...	7	86	34	117	112	102	127	James B. McElroy, M.D., Chairman of Faculty	Sept. 30	June 12	74
75	University of West Tennessee Medical Department, Memphis	162,351	C	12	...	5	...	1	32	31	80	80	80	80	M. V. Lynks, M.D., Dean	Sept. 26	May 20	75
76	Meharry Medical College, Nashville	118,342	B	197	3	41	...	2	27	31	112	112	112	127	John J. Mullowney, M.D., President	Oct 3	May 25	76
77	Vanderbilt University School of Medicine, Nashville	118,342	A	144	...	40	...	8	88	33	182	168	165	190	Lucius E. Burch, M.D., Act. Dean	Sept. 28	June 14	77
	TEXAS			**328**	**19**	**64**	**2**	**28**										
78	Baylor University College of Medicine, Dallas	158,976	A	124	6	38	2	14	92	32	195	190	190	190	McIver Woody, M.D., Dean	Sept. 26	May 30	78
79	University of Texas School of Medicine, Galveston [2]	44,255	A	204	13	26	...	14	39	32	88	58	40	27	W. S. Carter, M.D., Dean	Oct. 1	May 31	79
	UTAH			**54**	**1**	...	...	...										
80	University of Utah School of Medicine, Salt Lake City *	118,110	A	54	1	...	...	...	26	34	130	130	...	...	Perry G. Snow, M.D., Dean	Sept. 22	June 6	80
	VERMONT			**101**	**2**	**36**	...	**5**										
81	University of Vermont College of Medicine, Burlington	22,779	A	101	2	36	...	5	41	35	200	200	200	225	Henry Crain Tinkham, M.D., Dean	Sept. 21	June 19	81
	VIRGINIA			**280**	**18**	**50**	...	**18**										
82	Medical College of Virginia, Richmond	171,667	A	155	13	20	...	6	99	34	220	220	220	250	E. C. L. Miller, M.D., Dean	Sept. 14	May 30	82
83	University of Virginia Department of Medicine, Charlottesville	10,688	A	125	5	20	...	12	45	36	205	208	165	150	Theodore Hough, M.D., Dean	Sept. 15	June 13	83

E.—Eclectic; H.—Homeopathic; N.—Nondescript.

* Gives only the first two years of the medical course.

1. The College of Physicians and Surgeons of Los Angeles was suspended in 1920 but retains a nominal existence for three years to graduate the remaining classes which are being taught elsewhere.

2. The following state universities make an additional charge for students who are non residents, as follows: California, $175; Colorado, $30; Georgia, $90; Iowa, $25; Kansas, $10; Michigan, $60; Minnesota, $30; Missouri, $10; Ohio, $50; Tennessee, $50; Texas, $150; West Virginia, $150; Wisconsin, $124

3. Figures for enrolment and graduates are those for 1919-20.

4. Population given is the combined figures for Kansas City, Mo., Kansas City, Kan. and Rosedale, Kan.

5. Bowdoin Medical School has just been suspended.

6. Figures for enrolment are approximate; graduates exact.

7. Residents of Detroit are charged only $25 for tuition.

8. Figures for enrolment and graduates are approximate.

9. This school was ordered closed by the trustees in 1919, but continued for two sessions to permit the students already enrolled to finish their medical training. Its last class was graduated this year.

(Continued from page 527)

NUMBER OF MEDICAL GRADUATES

The total number of graduates for the year ending June 30, 1921, was 3,192, an increase of 145 over 1920, The number of graduates from the nonsectarian colleges was 2,969, or 143 more than last year. The number from the homeopathic colleges was 115, or 18 more than last year, and from the eclectic colleges there were 30 graduates, the same last year. The three nondescript colleges had 78 graduates, or 16 less than last year.

TABLE 5.—MEDICAL COLLEGE GRADUATES

Year	Nonsectarian	Homeopathic	Eclectic	Physio-Med.	Nondescript	Total
1880.....	2,673	380	188	..	..	3,241
1890.....	3,853	380	221	..	..	4,454
1900.....	4,715	413	86	..	..	5,214
1901.....	4,879	387	148	18	12	5,444
1902.....	4,508	336	138	16	11	5,009
1903.....	5,088	420	149	24	17	5,698
1904.....	5,190	371	146	20	20	5,747
1905.....	5,126	276	153	22	23	5,600
1906.....	4,841	286	186	22	29	5,364
1907.....	4,591	225	121	11	32	4,980
1908.....	4,370	215	116	12	28	4,741
1909.....	4,163	209	84	15	44	4,515
1910.....	4,113	183	114	16	14	4,440
1911.....	4,006	152	110	5	..	4,273
1912.....	4,206	185	92	..	..	4,483
1913.....	3,679	209	93	..	..	3,981
1914.....	3,370	154	70	..	..	3,594
1915.....	3,286	195	55	..	..	3,536
1916.....	3,274	166	78	..	..	3,518
1917.....	3,134	180	65	..	..	3,379
1918.....	2,454	114	42	..	60	2,670
1919.....	2,423	89	28	..	116	2,656
1920.....	2,826	97	30	..	94	3,047
1921.....	2,969	115	30	..	78	3,192

GRADUATES HOLDING DEGREES IN ARTS

Of the 3,192 medical graduates, 1,465 (see Table 11) had also obtained degrees in arts or science. This total includes those taking the combined courses in arts or science and medicine. This year 46.0 per cent. of all graduates held collegiate degrees, as compared with 43.5 per cent. last year and with 15.3 per cent. in 1910.

TABLE 6.—MEDICAL GRADUATES WITH LIBERAL ARTS DEGREES

Year	Nonsectarian			Homeopathic			Eclectic			Totals		
	Graduates	A.B., B.S.	Per Cent.	Graduates	A.B., B.S.	Per Cent.	Graduates	A.B., B.S.	Per Cent.	Graduates	A.B., B.S.	Per Cent.
1910.....	4,113	664	16.1	183	13	7.1	114	3	2.6	4,440	680	15.3
1911.....	4,006	683	17.0	152	18	11.8	110	4	3.6	4,273	705	16.5
1912.....	4,206	744	17.7	185	15	8.1	92	4	4.3	4,483	763	17.0
1913.....	3,679	732	19.9	209	20	9.6	93	1	1.1	3,981	753	18.9
1914.....	3,370	794	23.5	154	7	4.5	70	6	8.6	3,594	807	22.5
1915.....	3,286	839	25.5	195	16	8.2	55	3	5.5	3,536	858	24.3
1916.....	3,274	928	28.3	166	20	12.0	78	...	.....	3,518	948	26.9
1917.....	3,134	1078	34.4	180	19	10.5	65	2	3.1	3,379	1099	32.5
1918*.....	2,454	1007	41.0	114	15	13.2	60	...	.....	2,670	1024	38.4
1919*.....	2,423	1162	48.0	89	16	18.0	28	2	7.1	2,656	1180	44.4
1920*.....	2,826	1307	46.2	97	11	11.3	30	3	10.0	3,043	1321	43.5
1921*.....	2,969	1447	48.2	115	33	3.0	30	...	.....	3,192	1465	46.0

* No graduates of nondescript colleges during the last four years were reported to have collegiate degrees.

This increase is what was expected under the general adoption by medical schools of the entrance requirement of two years of college work. Of the 2,969 nonsectarian school graduates, 1,447, or 48.2 per cent., were reported to have baccalaureate degrees; of the

TABLE 1—STATISTICS OF MEDICAL COLLEGES IN THE UNITED STATES AND CANADA—(Concluded)

Marginal Number	NAME AND LOCATION OF COLLEGE	Population of City where College is Located (1920 Census Reports)	Classification by Council on Medical Education	No. of Students Registered 1920-21		Graduates 1921		(Grads. with A.B., B.S. or Ph.B.)	Number of Teachers	Weeks in College Year	Total Fees (Dollars)				Executive Officer	Session of 1921-22	
				Men	Women	Men	Women				1st year	2d year	3d year	4th year		Begins 1921	Ends 1922
84	WEST VIRGINIA																
	West Virginia University School of Medicine, Morgantown *9	12,127	A	76 76	2 2	...	...	...	15	35	50	50	...	...	John N. Simpson, M.D., Dean	Sept. 19	June 13
85	WISCONSIN																
86	University of Wisconsin Medical School, Madison *2	38,378	A	286	17	17	...	...	59	35	90	90	...	...	Charles R. Bardeen, M.D., Dean	Sept. 19	June 10
	Marquette University School of Medicine, Milwaukee	457,147	A	145 141	16 1	...	...	...	98	34	300	300	300	300	Eben J. Carey, M.D., Dean	Oct. 3	June 17
87	PHILIPPINE ISLANDS																
	University of the Philippines College of Med. and Surg., Manila	266,943	..	143 143	... ...	23 23	... ...	17 17	71	...	...	...	...	...	Fernando Calderon, M.D., Dean	July 1	April 4
88	CANADA *10																
89	University of Alberta Faculty of Medicine, Edmonton, Alta.11	60,000	..	3125 164	150 11	391 ...	15 ...	39 ...	47	30	100	100	100	100	Cecil E. Race, Registrar	Sept. 26	May 12
90	Dalhousie University Faculty of Medicine, Halifax, N. S.	46,619	..	152	9	15	1	...	48	31	175	175	175	175	John Stewart, Dean	Oct. 5	May 27
91	Queen's University Faculty of Medicine, Kingston, Ont.12	18,874	..	240	...	40	...	...	50	32	135	144	144	134	J. C. Connell, M.D., Dean	Sept. 28	May 26
92	University of Toronto Faculty of Medicine, Toronto, Ont.12	376,538	..	1019	87	131	12	14	256	32	161	161	161	181	A. Primrose, M.D., Dean	Sept. 27	May 31
93	Western University Medical School, London, Ont.12	46,300	..	133	4	12	...	...	53	31	145	153	153	178	Paul S. McKibben, M.D., Dean	Oct. 4	May 26
94	McGill University Faculty of Medicine, Montreal, Que.12	470,480	..	685	13	69	...	17	145	32	200	200	200	200	John W. Scane, M.D., Registrar	Oct. 1	June 6
95	University of Montreal Medical Faculty, Montreal, Que.12	470,480	..	351	...	57	...	...	68	34	175	175	175	175	L. D. Mignault, M.D., Registrar	Sept. 15	June 20
96	Laval University Faculty of Medicine, Quebec, Que.	78,190	..	125	...	25	...	...	35	36	90	90	90	90	Arthur Vallee, M.D., Secretary	Sept. 15	June 15
	University of Manitoba Faculty of Medicine, Winnipeg	136,035	..	240	26	32	2	8	111	29	150	160	160	160	S. Willis Prowse, M.D., Dean	Sept. 14	April 24

E.—Eclectic; H.—Homeopathic; N.—Nondescript.

* Gives only the first two years of the medical course.

10. The Canadian schools count the one or two years devoted to premedical sciences as a part of the medical course. The fees for the last four years are shown. Enrolments include students of all years.

11. Population of Edmonton is approximate. The University of Alberta gives the first four years of the Canadian six-year course.

12. These medical schools now require a six-year course which includes both premedical and medical subjects as given in medical schools in the United States.

115 homeopathic graduates, 33, or 3.0 per cent., were so reported, and of the 30 eclectic graduates this year, none was reported as holding such degrees. Of the 78 graduates of the nondescript colleges only one was reported as holding a bachelor's degree in arts or science. As will be noted by referring to Table 11, of the 1,468 graduates holding baccalaureate degrees, 203—the largest number—came from the New York colleges. Illinois, which heretofore has continually reported the highest numbers, this year reported 191, Pennsylvania reported 172 and Ohio reported 114. The percentage of graduates holding collegiate degrees will probably continue to increase, since all the better medical schools are now requiring two years of college work for admission, which brings more students in reach of the combined course for the B.S. and M.D. degrees.

WOMEN IN MEDICINE

During the past year there were 879 women studying medicine, or 61 more than last year. The percentage of women to all medical students this year is

TABLE 7.—WOMEN IN MEDICINE

Year	Total Women Students	Percentage of All Students, Both Sexes	Total Women Graduates	Percentage of Graduates, Both Sexes	Women's Colleges					Co-ed. Schools			
						Students	Percentage of All Women Students	Graduates	Percentage of All Women Graduates		Students	Percentage of All Women Students	Graduates	Percentage of All Women Graduates
1904	1,129	4.3	244	4.0	3	183	16.2	56	23.0	97	946	83.8	198	77.0
1905	1,073	4.1	219	4.0	3	221	20.6	54	24.5	96	852	79.4	165	75.5
1906	895	3.5	233	4.3	3	189	21.0	33	14.1	90	706	79.0	200	85.9
1907	928	3.8	211	4.2	3	210	22.6	39	18.5	86	718	77.4	172	81.5
1908	835	3.7	185	3.9	3	186	22.3	46	24.9	88	649	77.7	139	75.1
1909	921	4.2	162	3.7	3	169	18.4	33	20.3	91	752	81.6	129	79.7
1910	907	4.2	157	3.5	3	155	17.1	41	26.1	82	752	82.9	116	73.9
1911	680	3.4	159	3.7	2	134	19.7	36	22.6	74	546	80.3	123	77.4
1912	679	3.2	142	3.2	2	143	21.1	32	22.5	64	536	78.9	110	77.5
1913	640	3.8	154	3.8	2	138	21.6	33	21.4	55	502	78.6	121	78.6
1914	631	3.8	121	3.4	2	135	21.4	25	20.7	54	496	78.6	96	79.3
1915	592	4.0	130	3.7	2	116	19.6	38	29.2	53	462	80.4	92	70.8
1916	566	4.0	134	3.8	2	102	18.0	28	20.0	51	464	82.0	106	80.0
1917	610	4.5	153	4.5	2	81	13.3	29	18.9	56	529	86.7	124	81.1
1918	581	4.3	106	4.0	2	70	12.0	12	11.3	60	511	87.9	94	88.7
1919	686	5.2	107	4.0	1	66	10.0	7	6.5	59	620	90.4	100	93.4
1920	818	5.8	134	4.4	1	89	10.9	12	9.0	64	727	90.1	122	91.0
1921	879	5.9	151	4.7	1	103	11.5	15	10.0	63	776	88.5	136	90.0

5.9, the largest percentage since the presenting of these statistics was begun. There were 151 women graduates this year, 17 more than last year. Of all the women matriculants, 103 were in attendance at the one medical college for women, while 776 (88.5 per cent.) were matriculated in the 63 coeducational colleges. From the one women's college there were 15 graduates, while 136 (90 per cent.) secured their degrees from coeducational colleges. This increase of women students in coeducational colleges is not surprising, since in recent years most of the medical schools have thrown open their doors to women.

NUMBER OF COLLEGES

Since June 30, 1920, two medical colleges, the Bowdoin Medical College and the Fordham University School of Medicine, have closed, leaving 83 still existing. Of these 74 are nonsectarian (regular), 5 are homeopathic, 1 is eclectic and 3 are nondescript. Two of these nondescript colleges, the Kansas City University of Physicians and Surgeons and the Middlesex College of Medicine and Surgery, are intimately connected with osteopathy or give liberal advanced standing to students of osteopathic colleges. The third, the Kansas City College of Medicine and Surgery claims to be eclectic, but is reported as not so recognized by the National Eclectic Medical Association. The two nondescript colleges at Kansas City are not recognized by the licensing board of Missouri.

TABLE 8.—MEDICAL COLLEGES

Year	Nonsectarian	Homeopathic	Eclectic	Physio-Med.	Nondescript	Total
1850	44	3	4	1	..	52
1860	53	6	4	2	..	65
1870	60	8	5	2	..	75
1880	76	14	8	2	..	100
1890	106	16	9	2	..	133
1900	126	22	9	2	1	160
1901	125	22	10	2	1	160
1902	126	20	9	3	2	160
1903	126	20	9	3	2	160
1904	127	19	9	3	2	160
1905	125	19	9	3	2	158
1906	130	19	8	3	2	162
1907	127	18	9	3	2	159
1908	120	18	9	2	2	151
1909	115	15	8	1	1	140
1910	109	12	8	1	1	131
1911	103	12	7	..	..	122
1912	101	11	6	..	..	118
1913	92	10	5	..	..	107
1914	87	10	5	..	..	102
1915	83	9	4	..	..	96
1916	82	10	3	..	..	95
1917	83	9	4	..	..	96
1918	79	6	2	..	3	90
1919	76	5	1	..	3	85
1920	76	5	1	..	3	85
1921	74	5	1	..	3	83

LENGTH OF TERMS

During the last twenty years, as shown in Table 9, there has been a decided lengthening of college terms. This has reference to the weeks of actual work exclusive of holidays. Prior to 1904 the majority of colleges had sessions of twenty-eight weeks or less. For six

TABLE 9.—COLLEGE TERMS

Year	23 to 26 weeks		27 to 28 weeks		29 to 30 weeks		31 to 32 weeks		33 to 34 weeks		35 to 36 weeks		Over 36 weeks	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1901	58	36.5	42	26.4	8	5.0	26	16.4	4	2.5	18	11.3	3	1.9
1902	44	28.4	44	28.4	11	7.1	33	21.3	3	1.9	18	11.6	2	1.3
1903	33	21.4	46	29.9	15	9.7	37	24.0	2	1.3	19	12.4	2	1.3
1904	27	16.3	44	26.5	22	13.3	37	22.3	13	7.8	20	12.0	3	1.8
1905	15	9.4	35	21.8	12	7.5	44	27.5	13	8.1	28	23.8	3	1.9
1906	14	8.7	35	21.7	26	16.1	32	19.9	24	14.9	28	17.4	2	1.3
1907	6	3.7	27	16.8	26	16.1	42	26.1	29	18.0	29	18.0	2	1.3
1908	2	1.3	21	13.8	28	18.4	51	33.6	24	15.8	22	14.5	4	2.6
1909	4	2.3	17	11.6	23	16.4	51	34.9	18	12.3	30	20.5	3	2.0
1910	2	1.5	8	6.0	19	14.3	42	31.5	30	22.6	30	22.6	2	1.5
1911	..	....	6	5.0	16	13.3	37	30.8	32	26.7	28	23.4	1	0.8
1912	1	0.9	1	0.9	11	9.5	34	29.3	37	31.8	31	26.7	1	0.9
1913	..	....	3	2.8	5	4.7	29	27.4	41	38.7	27	25.5	1	0.9
1914	..	....	2	2.0	4	4.0	25	24.8	41	40.5	28	27.7	1	1.0
1915	..	....	1	1.0	5	5.3	22	23.2	36	37.9	30	31.6	1	1.0
1916	..	....	..	....	4	4.2	17	17.9	43	45.3	28	29.5	..	...
1917	..	....	..	....	1	1.0	15	15.6	46	47.9	31	32.3	..	...
1918*	..	....	..	....	2	2.2	23	25.6	37	41.1	22	24.4	..	...
1919*	..	....	..	....	1	1.2	11	12.9	44	51.8	23	27.1	1	1.2
1920*	..	....	..	....	1	1.2	10	11.8	38	44.7	29	34.1	..	...
1921*	..	....	..	....	..	....	11	13.1	39	46.4	28	33.3	..	...

* Information not furnished by six Class C colleges during the last four years.

years no colleges have had sessions shorter than twenty-nine weeks, and this year the shortest session reported is 31 weeks. Sessions of from thirty-three to thirty-six weeks were reported by 67, or 79.7 per cent., of all colleges.

(Continued on page 534)

Marginal Number	NAME OF COLLEGE	1 Alabama....218	2 Arizona....13	3 Arkansas....90	4 California....520	5 Colorado....138	6 Connecticut....258	7 Delaware....20	8 Dist. of Col. 108	9 Florida....54	10 Georgia....307	11 Idaho....41	12 Illinois....1,136	13 Indiana....428	14 Iowa....414	15 Kansas....274	16 Kentucky....143	17 Louisiana....130	18 Maine....91	19 Maryland....168	20 Massachusetts..699	Marginal Number
1	University of Alabama School of Medicine	25																				1
2	University of Arkansas Medical Department			12																		2
3	College of Medical Evangelists		1		100	8			4	1	1	2	3			6		1		2	3	3
4	Leland Stanford Junior University School of Medicine		1		108	6			1			3		1	1			1				4
5	University of California Medical School				198	2																5
6	University of Colorado School of Medicine					64							1	1	2	3						6
7	Yale University School of Medicine						86				1		1					1		2	1	7
8	Georgetown University School of Medicine						11		17				1	1	1			1	2	3	14	8
9	George Washington University Medical School	1			1	1	3		41	2	2						1			4	1	9
10	Howard University School of Medicine	5		1			2		26	5						5	4			4	2	10
11	Emory University School of Medicine	41								6	138				2		1					11
12	University of Georgia Medical Department										73											12
13	Chicago Medical School *												88									13
14	Hahnemann Med. College and Hosp. of Chicago.—H.			2			1						13	7	4	1	1					14
15	Loyola University School of Medicine					1	1				1		124	5	8	3	1				2	15
16	Northwestern University Medical School	5	2	5	10	7				1	3	6	164	14	21	12	2	1			1	16
17	Rush Medical College (University of Chicago)	2	1	1	10	15			1	2	2	9	297	43	34	27	5		1			17
18	University of Illinois College of Medicine		2	1	4	3							237	11	16	1	1					18
19	Indiana University School of Medicine													238								19
20	State University of Iowa College of Medicine	1										1	2		249							20
21	University of Kansas School of Medicine					1								1	1	119						21
22	University of Louisville Medical Department	5		4	43					2	2	1	4	34	3	2	62				2	22
23	Tulane University of Louisiana School of Medicine	70	1	24	2	1	2			11	13			1				101				23
24	Bowdoin Medical School	6		2	11	5	9	2	6	3	13		8	3					45			24
25	Johns Hopkins University Medical Department	1					13	3		2		1			3	2	7	2	4	58	9	25
26	Univ. of Maryland Sch. of Med. and Coll. of P. & S.						5										1			68	2	26
27	Boston University School of Medicine	1					5	1		1	4					1					37	27
28	College of Physicians and Surgeons, Boston †																				32	28
29	Harvard University Medical School	3			14	7	17		2	1	7		10	3	2	2	1		23	4	140	29
30	Tufts College Medical School	1					17						1						7		281	30
31	Middlesex College of Medicine and Surgery.—N.†																				121	31
32	University of Michigan Medical School	1	1	1	2	3	4		1	1	3	1	12	18		1	3			1	2	32
33	University of Michigan Homeopathic Med. School.—H.				2		1						1									33
34	Detroit College of Medicine and Surgery																					34
35	University of Minnesota Medical School				3	1			1			1	3	1	4						1	35
36	University of Mississippi School of Medicine	2																1				36
37	University of Missouri School of Medicine	1											1									37
38	Kansas City College of Medicine and Surgery.—N.†															20						38
39	Kansas City Univ. of Physicians and Surgeons.—N.†															15						39
40	St. Louis College of Physicians and Surgeons †		2										14			8						40
41	St. Louis University School of Medicine				13	2	1			1		1	42	7	14	11	1	2		2		41
42	Washington University School of Medicine		1	7	5	1							27	3	6	9					1	42
43	Creighton University College of Medicine					5						2	1	1	19	9						43
44	University of Nebraska College of Medicine				7	1	1					2			8	3						44
45	Dartmouth Medical School						2						1								4	45
46	Albany Medical College													1							1	46
47	University of Buffalo Medical Department						2				1											47
48	Columbia University College of Phys. and Surgs.	1	1	1	2	1	14				3			1			1				5	48
49	Cornell University Medical College	1			2		9				1		2			1	1		1		7	49
50	Fordham University School of Medicine						4															50
51	Long Island College Hospital						6														1	51
52	New York Homeo. Med. College and Flower Hosp.—H.				1																	52
53	University and Bellevue Hospital Medical College	1			1		9		1		2			1	3						1	53
54	Syracuse University College of Medicine						1														2	54
55	University of North Carolina School of Medicine										1											55
56	Wake Forest College School of Medicine									1										1		56
57	University of North Dakota School of Medicine																					57
58	Eclectic Medical College, Cincinnati.—E.			1	1		1						3	1		1	9		1	1		58
59	University of Cincinnati College of Medicine				2								3	14		1	12					59
60	Western Reserve University School of Medicine	2								1			2	2		3						60
61	Ohio State University College of Medicine													3								61
62	Ohio State University College of Homeo. Med.—H.													1			1			1		62
63	University of Oklahoma School of Medicine			4									3			1		1				63
64	University of Oregon Medical School				4	1						3			1							64
65	Hahnemann Med. Coll. & Hosp. of Philadelphia.—H.				1		1	3									1			1		65
66	Jefferson Medical College of Philadelphia	2		1	2		12	8	1	1	5	3	2	3		4	2		4	4	9	66
67	Temple University School of Medicine	1																	1		2	67
68	University of Pennsylvania School of Medicine	4			4	2	6	1		3	2		2	2	1	4	3		2	6	2	68
69	Woman's Medical College of Pennsylvania	1			1		4	2	1	1	1		1	1	1	1	3			2	3	69
70	University of Pittsburgh School of Medicine												1									70
71	Medical College of the State of South Carolina										1											71
72	University of South Dakota College of Medicine															2						72
73	University of Tennessee College of Medicine	2		5							1		1			1						73
74	University of West Tennessee Medical Department ‡																					74
75	Meharry Medical College	9		12					1	2	16		8			1	6	10		1	1	75
76	Vanderbilt University School of Medicine	17		6	2					3	5		1	1			10	12				76
77	Baylor University College of Medicine	1			1									1		1		2				77
78	University of Texas School of Medicine																					78
79	University of Utah School of Medicine				2							1			1							79
80	University of Vermont College of Medicine						5			1											7	80
81	Medical College of Virginia						1				1									1	1	81
82	University of Virginia Department of Medicine	2					1		4	2	4						2			1		82
83	West Virginia University School of Medicine						1														2	83
84	University of Wisconsin Medical School	1											9	3	2							84
85	Marquette University School of Medicine	1											5		5							85
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

E.—Eclectic; H.—Homeopathic; N.—Nondescript.

* Figures are for 1919-20; distribution approximate.

Marginal Number	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51		
	Michigan.....514	Minnesota.....404	Mississippi.....141	Missouri.....615	Montana.....41	Nebraska.....262	Nevada.....7	New Hampshire..46	New Jersey.....391	New Mexico.....15	New York....2,103	North Carolina 318	North Dakota...82	Ohio.....781	Oklahoma.....122	Oregon.....148	Pennsylvania.1,050	Rhode Island....91	South Carolina 165	South Dakota...99	Tennessee.....191	Texas.....462	Utah.....110	Vermont.....68	Virginia.....315	Washington....130	West Virginia...147	Wisconsin.....369	Wyoming.....6	Philippines, etc. 124	Foreign.....285	Totals.....14,872	
1	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	26	1
2	....	....	....	1	....	1	....	....	1	....	3	1	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	....	22	2
3	8	3	....	1	2	8	1	....	1	2	4	....	1	....	1	3	1	....	....	1	3	....	....	....	1	13	....	2	1	2	5	196	3
4	....	....	....	1	1	....	4	....	....	....	1	....	....	1	....	6	....	....	....	....	....	....	6	1	....	13	....	....	....	....	....	5	161	4
5	....	1	....	....	....	1	....	....	....	....	1	....	....	1	....	3	....	....	....	....	....	....	1	....	....	1	....	1	....	....	....	3	213	5
6	....	1	....	....	....	....	....	....	....	1	1	....	....	....	....	....	1	....	....	....	....	3	....	....	1	....	....	....	1	1	1	1	83	6
7	....	1	....	....	....	....	....	1	4	....	7	....	....	5	....	....	2	1	1	....	....	....	....	....	....	....	....	1	....	1	3	119	7
8	3	6	....	....	1	....	....	....	27	....	38	....	....	2	....	....	22	5	....	....	....	1	....	....	4	....	....	....	....	4	8	172	8
9	2	....	....	....	....	1	....	....	6	....	11	4	1	1	....	....	6	....	....	....	....	....	4	....	9	....	....	1	....	5	6	114	9
10	....	....	2	1	....	....	....	....	4	....	11	9	....	3	2	....	11	2	5	....	....	3	....	....	9	....	2	....	....	3	10	131	10
11	....	....	....	1	....	....	....	....	....	....	1	7	....	....	....	....	....	....	3	....	6	....	....	....	1	....	1	....	....	....	3	211	11
12	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	7	....	....	....	....	....	....	....	....	....	....	....	2	83	12
13	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	88	13
14	1	....	....	2	....	....	....	....	....	....	2	....	1	6	....	....	2	....	2	1	....	....	....	....	1	1	....	....	....	5	16	68	14
15	11	5	....	2	....	1	....	....	....	....	3	....	....	2	....	....	3	1	....	....	2	....	....	....	....	1	....	10	....	9	8	244	15
16	19	8	8	21	2	11	....	....	2	1	3	....	15	11	6	1	4	....	....	5	1	5	9	....	1	19	....	20	....	3	5	434	16
17	16	14	3	12	8	10	2	2	2	1	5	1	13	14	2	17	1	....	1	22	6	11	6	....	1	7	....	57	1	7	9	703	17
18	4	6	....	2	1	2	....	....	....	1	3	1	2	1	....	....	3	....	1	3	....	....	1	....	....	1	....	5	....	4	3	320	18
19	....	1	....	....	....	....	....	....	....	....	....	1	....	5	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	3	1	251	19
20	....	2	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	1	....	....	....	....	....	1	....	4	5	268	20
21	....	....	....	5	....	....	....	....	1	1	....	....	....	....	2	....	....	....	....	1	....	....	....	....	....	....	....	....	....	2	....	134	21
22	....	1	....	5	1	....	....	....	....	1	2	1	....	15	....	....	3	....	1	....	3	3	....	....	6	1	10	1	....	1	....	179	22
23	....	....	41	1	....	....	....	....	2	....	25	13	....	....	4	....	1	4	....	2	5	45	....	....	3	....	....	....	....	7	1	380	23
24	....	....	....	....	....	....	....	1	2	....	7	....	....	....	1	....	....	1	....	....	....	1	....	1	....	....	....	....	....	....	1	65	24
25	3	1	2	4	....	2	....	....	9	....	27	17	3	25	....	4	28	5	9	1	9	11	....	....	22	2	7	1	1	2	15	363	25
26	3	....	....	....	....	....	....	....	28	....	51	11	....	1	....	....	24	1	2	....	1	....	3	....	9	....	15	....	....	....	11	251	26
27	....	....	....	....	....	....	....	4	4	....	34	3	....	....	....	....	4	1	6	....	....	....	....	1	2	....	....	1	....	....	12	122	27
28	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	32	28
29	5	2	....	13	....	12	....	8	10	....	32	2	....	17	4	9	18	18	3	....	1	6	3	3	6	2	....	11	1	1	19	442	29
30	....	....	....	....	....	....	....	12	5	....	27	....	....	....	....	....	4	36	....	....	....	....	....	....	....	....	....	....	....	....	7	398	30
31	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	121	31
32	227	2	....	6	1	2	....	1	4	2	31	1	1	46	....	....	31	....	1	2	2	1	....	....	....	4	3	3	....	7	16	449	32
33	32	....	....	....	....	....	....	....	....	....	5	....	1	3	....	....	2	....	1	....	....	....	....	....	....	....	....	1	....	1	....	50	33
34	151	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	4	158	24
35	2	318	....	1	1	....	....	....	1	....	5	....	7	2	....	1	1	....	....	11	....	....	....	....	....	1	....	8	....	....	4	384	35
36	....	....	44	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	49	36
37	....	....	....	73	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	81	37
38	....	....	....	70	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	90	38
39	....	....	....	75	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	90	39
40	....	....	....	90	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	5	120	40
41	9	4	....	101	3	2	....	....	2	2	7	....	....	32	1	....	3	....	....	3	....	1	....	....	1	1	....	4	....	8	3	284	41
42	....	....	2	92	2	1	....	....	1	1	1	1	1	3	3	1	....	....	....	2	....	3	3	....	1	3	....	3	....	1	3	188	42
43	....	5	....	1	9	45	....	....	....	....	....	....	....	1	....	....	....	....	....	10	....	....	1	....	....	6	....	....	....	1	....	116	43
44	....	....	....	3	2	150	....	....	....	....	1	....	....	....	....	1	....	....	....	5	....	....	1	....	....	....	....	1	....	9	1	196	44
45	....	....	....	1	....	....	....	3	....	....	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	18	45
46	....	....	....	....	....	....	....	....	4	....	84	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	92	46
47	....	....	....	....	....	....	....	....	....	....	203	....	....	1	....	....	10	....	....	....	....	....	....	....	....	....	....	1	....	....	1	219	47
48	1	....	....	....	....	....	....	4	48	....	248	2	....	3	....	1	4	4	....	....	2	2	1	1	1	2	1	....	2	7	364	48
49	....	....	....	....	....	1	....	2	28	....	152	1	....	2	....	....	6	2	2	....	....	....	1	....	....	1	....	....	1	4	228	49
50	....	....	....	....	....	....	....	....	7	....	54	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	66	50
51	....	....	....	....	....	1	....	....	1	....	259	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	1	276	51
52	....	....	....	....	....	....	....	....	5	....	120	....	....	1	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1	1	130	52
53	....	....	1	1	....	....	....	....	55	....	344	1	....	....	....	....	1	1	....	....	2	....	....	....	....	....	....	....	....	....	3	428	53
54	....	....	....	....	....	....	....	....	1	....	143	1	....	....	....	....	4	....	....	....	....	....	....	....	2	....	....	....	....	5	....	159	54
55	....	....	....	....	....	....	....	....	....	....	....	68	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	72	55
56	....	....	....	....	....	....	....	....	2	....	....	42	....	....	....	....	....	....	2	....	....	....	....	....	1	....	....	....	....	....	....	49	56
57	....	2	....	....	2	....	....	....	....	....	....	....	32	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	2	39	57
58	2	....	....	....	....	2	....	....	2	....	28	....	....	38	....	....	4	....	....	....	....	....	....	....	....	....	2	....	....	....	1	98	58
59	2	2	....	....	....	1	....	....	....	....	1	....	....	169	1	....	3	....	....	....	1	1	....	....	2	1	19	....	....	1	2	238	59
60	....	....	1	....	....	....	....	....	....	....	1	....	....	112	....	....	9	....	1	....	....	....	1	....	2	1	6	2	....	....	6	152	60
61	....	....	....	....	....	....	....	....	1	....	1	....	....	167	....	....	....	....	....	....	....	....	....	....	....	....	4	....	....	3	1	180	61
62	....	....	....	....	....	....	....	....	....	....	....	....	....	34	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	1	....	40	62
63	....	....	....	3	....	....	....	....	....	....	....	....	....	....	82	....	....	....	....	....	1	5	....	....	....	....	....	....	....	2	1	103	63
64	....	1	....	1	1	....	....	....	....	....	....	....	....	....	....	98	....	....	....	....	....	....	....	....	....	21	....	....	....	....	....	131	64
65	....	2	....	1	....	....	....	....	19	....	10	....	....	1	....	....	107	....	....	....	....	....	....	....	2	....	1	....	....	....	2	152	65
66	1	3	1	6	....	2	....	....	37	....	26	42	3	22	....	3	227	4	14	....	3	3	12	2	3	3	19	3	....	2	10	514	66
67	....	....	....	....	....	....	....	....	12	....	6	....	....	....	....	....	49	....	1	....	....	....	....	....	....	....	1	....	....	1	....	74	67
68	2	1	5	4	....	2	....	2	26	....	9	26	1	3	1	....	243	1	1	2	8	6	7	....	6	5	4	10	1	6	7	433	68
69	....	....	1	....	....	....	....	....	6	....	7	5	....	5	....	....	40	....	....	....	1	....	....	1	4	....	....	....	....	....	10	103	69
70	....	1	....	....	....	....	....	....	....	....	1	....	....	7	....	....	147	....	....	....	....	....	....	....	....	....	....	....	....	....	....	157	70
71	....	....	....	....	....	....	....	....	1	....	....	....	....	1	....	....	....	....	76	....	....	....	....	....	1	....	....	....	....	....	....	80	71
72	....	1	....	....	1	....	....	....	....	....	2	....	....	....	....	....	1	....	....	25	....	....	....	....	....	....	....	....	....	....	....	32	72
73	....	....	3	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	38	3	....	....	....	....	....	....	....	....	....	55	73
74	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	12	....	....	....	....	....	....	....	....	....	....	12	74
75	4	....	18	11	....	3	....	....	....	....	2	13	....	5	5	....	1	....	16	....	13	20	....	....	8	....	....	....	....	....	14	200	75
76	....	....	4	2	....	....	....	....	1	....	2	4	....	....	2	....	....	....	5	....	63	10	....	....	1	....	....	1	....	....	2	144	76
77	....	....	....	1	....	....	....	1	1	....	11	2	....	....	3	....	....	....	....	....	....	101	....	....	....	....	....	....	....	2	2	130	77
78	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	....	....	....	....	....	....	213	....	....	....	....	....	....	....	....	1	217	78
79	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	....	....	....	....	....	....	47	....	....	1	....	....	....	....	1	55	79
80	....	....	....	....	....	....	....	5	8	....	14	....	....	....	....	....	1	4	....	....	....	....	....	55	....	....	....	....	....	1	2	103	80
81	....	....	....	....	....	....	....	....	....	....	2	28	....	....	....	....	1	....	1	....	....	....	1	....	122	....	4	1	....	2	2	168	81
82	....	....	3	....	....	....	....	....	2	....	5	9	....	....	1	....	1	....	4	....	6	1	....	....	79	....	2	....	....	....	1	130	82
83	....	....	....	....	....	....	....	....	2	....	5	1	....	6	....	....	13	....	....	....	....	1	....	....	....	....	46	....	....	1	1	78	83
84	1	1	....	....	3	....	1	....	....	1	....	....	....	....	....	....	....	....	....	2	....	1	....	....	....	....	....	136	....	....	....	161	84
85	5	9	....	....	....	1	....	....	....	....	2	....	....	2	....	....	....	....	....	....	....	....	....	....	....	2	....	110	....	....	....	142	85
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51		

† Figures and distribution approximate.

‡ Figures exact; distribution approximate.

Name of College	Enrolled During 1920-21					
	1st year	2d year	3d year	4th year	5th year	Total
University of Alabama School of Med.*..	26	...	...	...	...	26
University of Arkansas Medical Dept.*...	13	9	...	...	...	22
College of Medical Evangelists.....	73	43	43	38	...	197
Leland Stanford Junior University School of Medicine	56	36	23	30	16	161
University of California Medical School..	52	47	47	40	27	213
University of Colorado School of Med..	30	23	16	14	...	83
Yale University School of Medicine.....	56	30	16	17	...	119
Georgetown University School of Med. ...	72	53	26	21	...	172
George Washington Univ. Med. School...	53	16	15	30	...	114
Howard University School of Medicine...	43	36	17	35	...	131
Emory University School of Medicine.....	60	60	47	44	...	211
University of Georgia Medical Dept.	36	14	13	20	...	83
Chicago Medical School †.....	16	20	25	27	...	88
Hahnemann Medical College and Hospital of Chicago.—H.	32	14	10	12	...	68
Loyola University School of Medicine....	51	14	16	92	71	244
Northwestern University Medical School..	115	81	85	75	78	434
Rush Medical College (Univ. of Chicago).	143	142	143	143	132	703
University of Illinois College of Med.	113	84	51	72	...	320
Indiana University School of Medicine....	87	60	35	61	8	251
State University of Iowa College of Med.	110	66	47	45	...	268
University of Kansas School of Medicine	51	30	21	32	...	134
University of Louisville Medical Dept. ...	69	39	20	51	...	179
Tulane Univ. of Louisiana School of Med.	101	81	77	121	...	380
Bowdoin Medical School.....	29	20	8	8	...	65
Johns Hopkins University Med. Dept. ...	88	97	88	90	...	363
University of Maryland School of Medicine and College of Phys. and Surgs...	79	44	55	73	...	251
Boston University School of Medicine.....	62	23	22	15	...	122
College of Phys. and Surgs., Boston ‡....	8	9	8	7	...	32
Harvard University Medical School.....	127	107	103	105	...	442
Tufts College Medical School.....	160	72	78	88	...	398
Middlesex College of Med. and Surg.—N.	21	25	25	50	...	121
University of Michigan Medical School...	170	126	78	75	...	449
Univ. of Michigan Homeo. Med. Sch.—H.	16	20	7	7	...	50
Detroit College of Medicine and Surgery..	56	24	22	56	...	158
University of Minnesota Medical School..	95	74	75	81	59	384
University of Mississippi School of Med.*	26	23	...	...	...	49
University of Missouri School of Med.*...	39	42	...	...	...	81
Kansas City College of Med. & Surg.—N.‡	30	26	20	14	...	90
Kansas City Univ. of Phys. & Surgs.—N.	12	8	45	25	...	90
St. Louis College of Physicians and Surgeons	13	14	28	65	...	120
St. Louis University School of Medicine..	97	69	41	77	...	284
Washington University School of Med. ...	60	36	47	45	...	188
Creighton University College of Medicine	41	32	21	22	...	116
University of Nebraska College of Med...	54	68	24	50	...	196
Dartmouth Medical School *.....	12	6	...	...	...	18
Albany Medical College.....	42	21	12	17	...	92
University of Buffalo Medical Dept.	76	60	23	60	...	219
Columbia Univ. Coll. of Phys. & Surgs..	94	84	69	117	...	364
Cornell University Medical College.....	72	67	43	46	...	228
Fordham University School of Medicine..	...	...	1	65	...	66
Long Island College Hospital.....	50	97	47	82	...	276
New York Homeopathic Medical College and Flower Hospital.—H.	45	27	18	40	...	130
University and Bellevue Hospital Medical College	152	94	78	104	...	428
Syracuse University College of Medicine..	54	36	35	34	...	159
University of No. Carolina Sch. of Med.*	42	30	...	...	...	72
Wake Forest College School of Medicine *	24	25	...	...	...	49
University of No. Dakota Sch. of Med.*	22	17	...	...	...	39
Eclectic Medical College, Cincinnati.—E. ..	17	18	33	30	...	98
University of Cincinnati College of Med.	67	64	45	62	...	238
Western Reserve University Sch. of Med.	59	30	27	36	...	152
Ohio State University College of Med. ...	61	51	32	36	...	180
Ohio St. Univ. Coll. of Homeo. Med.—H.	12	7	11	10	...	40
University of Oklahoma School of Med. .	38	32	16	17	...	103
University of Oregon Medical School.....	55	44	16	16	...	131
Hahnemann Medical College and Hospital of Philadelphia.—H.	55	25	20	52	...	152
Jefferson Medical College of Philadelphia	164	141	94	115	...	514
Temple University School of Medicine....	...	21	24	29	...	74
University of Pennsylvania Sch. of Med.	99	95	119	120	...	433
Woman's Medical College of Pennsylvania	32	24	32	15	...	103
University of Pittsburgh School of Med.	59	39	24	35	...	157
Med. College of the State of So. Carolina	32	23	15	10	...	80
University of So. Dakota Coll. of Med.*	20	12	...	...	...	32
University of Tennessee College of Med. ..	10	12	7	26	...	55
University of West Tennesse Med. Dept.	2	2	3	5	...	12
Meharry Medical College.....	53	67	35	45	...	200
Vanderbilt University School of Med.	54	36	14	40	...	144
Baylor University College of Medicine....	35	30	25	40	...	130
University of Texas School of Medicine...	99	47	45	26	...	217
University of Utah School of Medicine*..	32	23	...	...	...	55
University of Vermont College of Med. ..	29	21	17	36	...	103
Medical College of Virginia.....	68	44	26	30	...	168
University of Virginia Dept. of Med.	58	30	22	20	...	130
West Virginia University School of Med.*	46	32	...	...	...	78
University of Wisconsin Medical School *.	93	68	...	...	...	161
Marquette University School of Medicine	50	29	21	27	15	142
Totals for 1921.....	4825	3588	2637	3416	406	14872
Totals for 1920.....	4234	2837	3464	3263	290	14088
Totals for 1919.....	3104	3587	3272	2967	122	13052

E.—Eclectic; H.—Homeopathic; N.—Nondescript.
* Gives only the first two years of the medical course.
† Figures given are for 1919-20.
‡ Figures and distribution are approximate.

(Continued from page 531)

TUITION AND OTHER FEES

Attention is called in Table 1, on pages 528-530, to the amount charged by the various medical colleges per annum for tuition, matriculation, laboratory and graduation fees for each student. In Table 10, the eighty-three colleges have been grouped according to the amount of fees charged and according to their classification by the Council on Medical Education and Hospitals. Fourteen colleges charge fees of $125 or less per year; forty-six between $125 and $225; nineteen between $225 and $325 and four charge above $325. Of the fourteen colleges charging $125 or less eleven (78.6 per cent.) are listed among Class A (acceptable) colleges [2] by the Council on Medical Education, while two are in Class B. The eleven Class A colleges having these low fees include the schools of medicine of the state universities of Iowa, Missouri, Oklahoma, North Dakota, South Dakota, Texas and West Virginia—for residents of those states. On the other hand, three colleges listed by the Council in Class C charge fees of $175 to $225 per year. Diplomas from Class C colleges are reported as not recognized by from 42 to 44 state licensing boards.[3] No intelligent student would knowingly spend his time and money in a low-grade college, the diplomas of which are not recognized by many states, when in the same time, and for even less money, he could attend one of the best-equipped colleges, the diplomas of which are recognized everywhere. Although 42 colleges listed in Class A charge fees ranging from $175 to $350 per year for each student, the actual expense for teaching that student for the year in these colleges is much more than the fee charged. This larger expenditure is possible because the colleges receive either state aid or private endowment. This shows that no medical college can properly teach medicine on the income received from fees alone. Although during the last two years fees have been increased, this in no way compares with the greatly

TABLE 10.—COLLEGE FEES

Total Fees	Number of Colleges			
	Class A	Class B	Class C	Total
$ 75 or less.....	4	1	..	5
75 to $125.....	7	1	1	9
125 to 175.....	15	3	3	21
175 to 225.....	21	1	3	25
225 to 275.....	10	2	..	12
275 to 325.....	7	..	..	7
Above 325.....	4	..	..	4
Totals.....	68	8	7	83

2. See classification on page 544.
3. See THE JOURNAL A. M. A., April 30, 1921, p. 1240, Table D.

increased cost of furnishing a medical education. Although fees have been moderately advanced, at the same time, greater provision has been made for scholarships and loan funds (see page 537) for benefit of deserving students who are financially poor.

COLLEGES, STUDENTS AND GRADUATES BY STATES

Illinois formerly had the largest number of medical colleges (Table 11), but for the last four years the first place has been held by New York, where there are still

TABLE 11.—MEDICAL COLLEGES, STUDENTS AND GRADUATES BY STATES

State	Colleges		Students		Graduates		Graduates with B.S. or A.B.
	Total	Class C	Men	Women	Men	Women	
Alabama	1	....	26	....	....	....	....
Arkansas	1	....	20	2	....	....	....
California	3	....	496	78	82	2	64
Colorado	1	....	74	9	13	2	4
Connecticut	1	....	112	7	15	1	12
Dist. of Columbia	3	....	405	12	78	1	49
Georgia	2	....	294	....	59	....	23
Illinois	6	1	1,736	119	303	16	191
Indiana	1	....	241	10	57	3	55
Iowa	1		259	9	46	....	24
Kansas	1	....	128	6	27	2	17
Kentucky	1	....	172	6	48	1	12
Louisiana	1	....	365	15	115	3	47
Maine	..	....	65	....	8	....	3
Maryland	2	....	552	62	147	16	103
Massachusetts	5	2	1,072	43	232	12	96
Michigan	3	....	622	35	122	7	41
Minnesota	1	....	359	25	51	2	53
Mississippi	1	....	46	3	....	....	....
Missouri	6	3	832	21	208	6	61
Nebraska	2	....	302	10	71	1	27
New Hampshire	1	....	18	....	....	....	....
New York	8	....	1,824	138	551	23	203
North Carolina	2	....	121	....	....	....	....
North Dakota	1	....	38	1	....	....	....
Ohio	5	....	670	38	162	14	114
Oklahoma	1	....	98	5	15	2	13
Oregon	7	....	198	13	13	3	6
Pennsylvania	6	....	1,288	145	329	26	172
South Carolina	1	....	76	4	10	....	6
South Dakota	1	....	32	....	....	....	....
Tennessee	4	1	407	4	112	....	18
Texas	2	....	328	19	64	2	28
Utah	1	....	54	1	....	....	....
Vermont	1	....	101	2	36	....	5
Virginia	2	....	280	18	50	....	18
West Virginia	1	....	76	2	....	....	....
Wisconsin	2	....	286	17	17	....	....
Totals	83	7	13,993	879	3,041	151	1,465

eight colleges. Illinois, Missouri and Pennsylvania have six colleges each; Massachusetts and Ohio have five each, and Tennessee has four. Of Class C colleges, however, Missouri has three, Massachusetts has two, and there is one each in Illinois and Tennessee. In Missouri the Class C colleges are not recognized by the local state licensing board and exist because that board does not have or does not exert the power to have their charters revoked.

For the last four years New York has had the largest number of students enrolled, this year having 1,962, followed by Illinois with 1,855 and Pennsylvania with 1,433. New York leads also in the number of graduates, having reported 574, followed by Pennsylvania with 355, Illinois with 319, Massachusetts with 244 and Missouri with 214.

QUALIFICATIONS OF STUDENTS AND GRADUATES

Table 12 shows the students and graduates of the last six years grouped according to their classification by the Council on Medical Education and Hospitals. Note that during the nine years the percentage of students enrolled in Class A colleges has increased from 65.4 to 90.5, and that since 1917 the total number of students in attendance at these schools has increased from 11,317 to 13,482. Note, on the other hand that both the numbers and the percentages of students enrolled in Class B and Class C colleges have been reduced. The percentage of students in Class B colleges has been reduced from 24.4 to 5.6 and in Class C colleges from 10.2 to 3.9. Of graduates, also, the percentage in Class A colleges shows an increase, while in Class B and Class C colleges there has been a decrease. Such reductions as there have been in the total number of students and graduates, therefore, have been largely at the expense of the lower grade colleges, while the numbers of students and graduates in the better colleges have been increased.

HINTS TO PROSPECTIVE MEDICAL STUDENTS

The student who is contemplating the study of medicine should read with care the instructions entitled "Choice of a Medical School" beginning on page 540. The selection of the school in which he is to obtain his medical training is a matter of extreme importance and should be considered by the student with special care. He should note the standards of premedical education which are given on page 541, he should note the subjects required by the individual medical schools which, if different from those outlined by the Council on Medical Education and Hospitals, will be found in the descriptive statements of those colleges appearing on pages 547 to 556. A careful review of the material published this week will be of great service to such students.

GRADUATE MEDICAL EDUCATION

The facilities for graduate medical instruction in the United States are set forth on the next few pages. Not only are the separate graduate medical schools given, but also the opportunities available in undergraduate medical schools. In the latter, the courses vary somewhat from year to year, but the outlines given indicate

TABLE 12.—STUDENTS AND GRADUATES ACCORDING TO CLASSIFICATION

Year	Students						Graduates					
	Colleges Rated in Class						Colleges Rated in Class					
	A	%	B	%	C	%	A	%	B	%	C	%
1913	11,122	65.4	4,158	24.4	1,735	10.2	2,539	63.8	1,050	26.4	392	9.8
1914	12,336	74.7	2,838	17.2	1,328	8.1	2,626	73.1	686	19.1	282	7.8
1915	11,314	76.0	2,668	17.9	909	6.1	2,629	74.4	688	19.4	219	6.2
1916	11,162	79.6	2,087	14.9	773	5.5	2,630	74.7	695	19.8	193	5.5
1917	11,317	82.2	1,761	12.8	686	5.0	2,577	76.3	648	19.2	154	4.5
1918	11,522	84.5	1,488	10.9	620	4.5	2,024	75.8	399	14.9	247	9.2
1919	11,466	87.9	1,086	8.3	500	3.8	2,220	83.6	268	10.1	168	6.3
1920	12,610	89.6	680	4.8	798	5.6	2,690	88.4	152	5.0	205	6.6
1921	13,487	90.5	832	5.6	553	3.9	2,812	88.1	200	6.3	180	5.6

the variety and extent of such work. It is hoped that by the publication each year of these data opportunities in undergraduate schools may be enlarged and a greater use be made of the abundance of clinical material in this country. The majority of undergraduate medical schools are now on a par with those in other leading countries; their future development need not be hindered by providing also for the giving of graduate courses.

COLLEGE NOTES

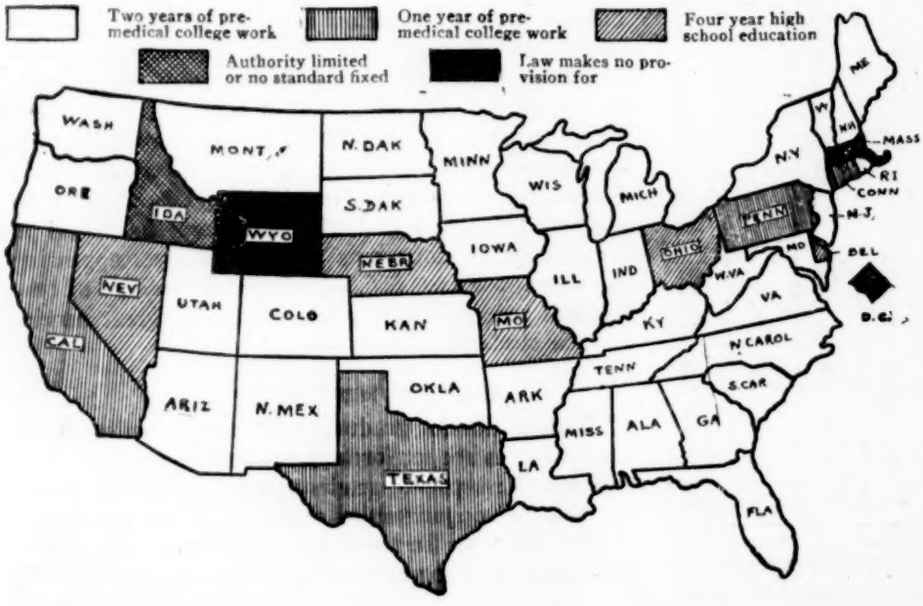
California.—A fund of $100,000, known as the John C. and Edward Coleman Memorial Fund, has been established at the University of California Medical School, the income from which is to be used in study and research of all problems relating to deafness, and in measures for developing a sympathetic understanding between the public and the deaf.

Pursuant to the request of the Surgeon-General of the United States Army, a unit of the Reserve Officers' Training Corps has been established at the University of California Medical School.

During the past year $55,000 in gifts have been received to assist in the establishing of three new hospital units in connection with the White Memorial Hospital, the clinical hospital of the College of Medical Evangelists at Los Angeles. An appropriation of $40,000 has been made for the erection of a nurses' dormitory which is being erected on land adjacent to the hospital. Through the kindness of a friend in furnishing funds for the support of the physician in charge and technicians, a department of metabolism has been organized.

Colorado.—The University of Colorado received $1,500,000 to be used for the erection of new laboratories and hospitals for the medical school. Of this sum, $700,000 was donated by the General Education Board, $600,000 was appropriated by the legislature and $200,000 raised by private subscription. The General Education Board has also provided $25,000 a year for a period of three years for maintenance.

STATE REQUIREMENTS OF PRELIMINARY EDUCATION



Georgia.—There are now under construction on the campus of Emory University School of Medicine at Atlanta four units of the New Wesley Memorial Teaching Hospital. The buildings will have a capacity of 245 beds for adults and thirty-five beds for children and will cost, with equipment, approximately $1,500,000. Four other units will be built later. The entire plant will represent an investment of practically $3,000,000. Under a contract between the university and the city of Atlanta, the buildings formerly occupied by the Atlanta Medical College will be altered and used as the negro division of the Grady Hospital. It will have a capacity of 200 beds, will be maintained by the city and will be under the control of the staff of Emory University School of Medicine.

Indiana.—Indiana University has received an appropriation of $125,000 from the state for the Riley Memorial Hospital, with $75,000 a year for two years and $50,000 a year thereafter for equipment and maintenance. The bill provides for the charging of the cost of patients back to their respective counties, so that full maintenance is provided. The hospital committee has announced an additional sum sufficient to make a total of $1,000,000. It is proposed to raise $375,000 at once so that with the state appropriation a total of $500,000 will be immediately available for building.

Massachusetts.—Boston University School of Medicine has increased its budget from $38,000 to $90,000 for the coming year. In addition the university is to expend $25,000 for added laboratory facilities in pathology, anatomy, physiology and chemistry and for improvement of the library. Several full-time professors have been added to the faculty.

An addition to the anatomical building, costing about $85,000, which will be used as a chemical laboratory, is announced for Tufts College Medical School.

Missouri.—St. Louis University is erecting an addition to its medical building which will be used for laboratories, library and administrative purposes.

New York.—The medical department of the University of Buffalo will participate in the $5,000,000 endowment fund raised for the university in October, 1920. New laboratories, providing facilities for student and research work, were completed in January, 1921. An agreement has been entered into with the department of hospitals and dispensaries of the city of Buffalo which makes available additional clinical material for teaching purposes.

A permanent affiliation between Columbia University and the Presbyterian Hospital was accomplished during the past year. The two institutions will proceed to plan for and erect new buildings in close geographical and functional relationship. This has been made possible through gifts of a million dollars each from the Carnegie Foundation, the Rockefeller Foundation and the General Educational Board, a plot of ground at Broadway and One Hundred and Sixty-Fifth Street and an additional million dollars from an anonymous donor. The two institutions will maintain their corporate independence but all affairs affecting the two will be in the hands of a joint administrative board consisting of three of the trustees of Columbia University, the managers of the Presbyterian Hospital and the dean of the medical faculty. Two additional grants from one of the foundations have been received for special work in epilepsy and rickets, which is being carried on, respectively, in the departments of neurology and pathology.

North Dakota.—Appropriations made by the legislature will allow some increases of salary for members of the faculty and additions to the equipment of the medical department of the University of North Dakota. The appropriations provide for additional technical assistants to be added during the next two years and for an assistant professor in anatomy and physiology to be procured for the third year.

Ohio.—In June, Mr. Samuel Mather presented $500,000 to the trustees of Western Reserve University to be used for new buildings for the school of medicine. Mr. Mather had previously given $300,000 for this purpose.

During the last session the Ohio legislature appropriated $1,900,000 for building purposes for the Ohio State University. A portion of this amount will be utilized in building a hospital and science building for the college of medicine. A number of full-time instructors will be added to the medical faculty for the ensuing year.

Oregon.—The Oregon legislature appropriated $271,000 for the use of the University of Oregon Medical School for the years 1920-1921. Of this sum, $113,000 was donated by the General Education Board contingent on the securing of a like amount from other sources for purposes of building. It is therefore proposed to build immediately a second wing to the medical school building at a cost of about $240,000. The new Multnomah County Hospital building is now in process of construction on the medical school campus. It will provide about 125 teaching beds for the medical school. It is expected that in the near future a children's hospital also will be erected on the medical school campus.

South Carolina.—A new building for the Medical College of the State of South Carolina for which $55,000 was appropriated in 1920 by the legislature has been completed and

will be used by the departments of physiology, pharmacology and experimental surgery.

Tennessee.—The state appropriation for maintenance of the University of Tennessee College of Medicine has been increased $10,000 over previous amounts. During the last year a new laboratory building to accommodate the departments of pathology, bacteriology and public health has been erected at a cost of $75,000. The four floors of the old buildings from which the departments mentioned have been removed will be used by the outpatient department.

Texas.—Baylor University College of Medicine received recently a gift of $30,000 from the General Education Board to be used for maintenance, equipment and salaries. A five story addition to the Baylor Hospital is now under construction which will house necropsy room, lecture rooms, laboratories and operating rooms. A building for women and children is also being built adjoining the main hospital. The two buildings will increase the capacity of the Baylor Hospital to about 400 beds.

Virginia.—For the first time in its history women were admitted to the University of Virginia Department of Medicine in the session of 1920-1921. During the year an emergency fund of $14,000 was subscribed by alumni and friends of the deparmtent of medicine to finance for two years the increased cost occasioned by increasing the number of men admitted to the freshman class from thirty-six to sixty-five.

Canada.—A new building for the University of Alberta Faculty of Medicine has been completed and equipped. It is said to be one of the finest of its kind in Canada.

During the year 1919-1920 the University of Manitoba received $500,000 from the Rockefeller Foundation as an endowment for the Faculty of Medicine, the amount to be available when certain conditions were complied with by the university authorities. These conditions, including the erection of additional medical buildings at a minimum cost of $400,000, have been met.

During the session of 1920-1921 the Rockefeller Foundation and the Carnegie corporation each contributed $500,000 to Dalhousie University Faculty of Medicine for the furtherance of medical education. Of these sums $400,000 is to be devoted to buildings and $600,000 to additional endowment. A maternity hospital has been erected on the university campus by the Salvation Army at a cost of $125,000. The free beds are to be used for clinical purposes by the Faculty of Medicine.

Scholarships in Medical Schools

As evidence that provision is being made for worthy students, regardless of their financial status, 469 scholarships are reported this year in the following forty-five medical schools:

University of Alabama School of Medicine, Tuscaloosa	67
Leland Stanford Junior University Medical School,* San Francisco	2
University of California Medical School,* San Francisco	6
University of Colorado School of Medicine,* Denver	1
Yale University School of Medicine,* New Haven	2
Georgetown University School of Medicine, Washington	2
Emory University Medical School,* Atlanta	11
Northwestern University School of Medicine,* Chicago	1
Rush Medical College, Chicago	7
University of Illinois College of Medicine, Chicago	84
Indiana University School of Medicine,* Bloomington and Indianapolis	12
State University of Iowa College of Medicine, Iowa City	1
University of Kansas School of Medicine,* Kansas City	1
Johns Hopkins University Medical Department, Baltimore	6
University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore	8
Boston University School of Medicine,* Boston	16
Medical School of Harvard University,* Boston	50
Detroit College of Medicine and Surgery, Detroit	8
University of Missouri School of Medicine,* Columbia	10
Washington University School of Medicine, St. Louis	2
University of Nebraska College of Medicine,* Omaha	6
Dartmouth Medical School,* Hanover, N. H.	2
University of Buffalo Department of Medicine,* Buffalo	1
Columbia University College of Physicians and Surgeons, New York	36
Cornell University Medical College,* New York	3
Syracuse University College of Medicine, Syracuse	1
University and Bellevue Hospital Medical College,* New York	1
University of North Carolina School of Medicine, Chapel Hill	1
University of Cincinnati College of Medicine,* Cincinnati	12
University of Oregon Department of Medicine,* Portland	5
Hahnemann Medical College and Hospital of Philadelphia*	12
Jefferson Medical College, Philadelphia	3
Temple University Department of Medicine, Philadelphia	3
University of Pennsylvania School of Medicine,* Philadelphia	4
University of Pittsburgh School of Medicine, Pittsburgh	3
Woman's Medical College of Pennsylvania,* Philadelphia	30
Medical College of the State of South Carolina, Charleston	8
University of Tennessee College of Medicine, Memphis	15
Vanderbilt University Medical Department, Nashville, Tenn.	4
University of Texas Department of Medicine,* Galveston	2
University of Vermont Medical School*	1
Medical College of Virginia, Richmond	10
University of Virginia Department of Medicine,* Charlottesville	2
West Virginia University School of Medicine,* Morgantown	1
University of Wisconsin Medical School, Madison	6
Total in 45 medical schools	469

Loan Funds

Besides the twenty-four colleges marked by an asterisk (*) in the above list which have loan funds for deserving but needy students, such funds are available also at the five following medical schools:

College of Medical Evangelists, Loma Linda, Calif.
Tulane University of Louisiana School of Medicine, New Orleans.
University of Michigan Medical School, Ann Arbor.
Wake Forest College School of Medicine, Wake Forest, N. C.
University of North Dakota School of Medicine, University.

Since the World War a large number of scholarships have been established in various medical schools for those who have been in military service. Such provision is made, also, in a number of medical schools for those preparing themselves as medical missionaries. Abundant facilities are available, also, particularly in the larger schools, for students to secure employment to pay at least a portion of their expenses.

State Requirements of Preliminary Education

There are now forty-one states (counting Alaska Ter.) which have adopted requirements of preliminary education in addition to a standard four-year high school education. These states, the number of college years required and the time the higher requirements became or become effective, are as follows:

State Examining Board of	One Year of College Work		Two Years of College Work	
	Affects Students Matriculating	Affects All Graduates	Affects Students Matriculating	Affects All Graduates
Alabama	.....	....	1915-16	1919
Alaska	1914-15	1918	1918-19	1922
Arizona	1914-15	1918	1918-19	1922
Arkansas	1915-16	1919	1918-19	1922
California	1915-16	1919	.....	....
Colorado	1908-09	1912	1910-11	1914
Connecticut	1911-12	1915	.....	....
Delaware*	.....	....	.....	....
District of Columbia†	.....	....	.....	....
Florida	1914-15	1918	1918-19	1922
Georgia	.....	....	1918-19	1922
Idaho*	.....	....	.....	....
Illinois	1915-16	1919	1918-19	1922
Indiana	1910-11	1914	1911-12	1915
Iowa	.....	....	1911-12	1915
Kansas	1910-11	1914	1918-19	1922
Kentucky	1914-15	1918	1918-19	1922
Louisiana	1915-16	1919	1918-19	1922
Maine	1915-16	1919	1916-17	1920
Maryland	1914-15	1918	1918-19	1922
Massachusetts†	.....	....	.....	....
Michigan	1914-15	1918	1918-19	1922
Minnesota	.....	....	1908-09	1912
Mississippi	1915-16	1919	1919-20	1923
Missouri*	.....	....	.....	....
Montana	1914-15	1918	1918-19	1922
Nebraska*	.....	....	.....	....
Nevada*	.....	....	.....	....
New Hampshire	1914-15	1918	1915-16	1919
New Jersey	1915-16	1919	1917-18	1921
New Mexico	1914-15	1918	1918-19	1922
New York	1917-18	1921	1918-19	1922
North Carolina	1914-15	1918	1918-19	1922
North Dakota	.....	....	1908-09	1912
Ohio*	.....	....	.....	....
Oklahoma	1914-15	1918	1917-18	1921
Oregon	.....	....	1920-21	1924
Pennsylvania	1914-15	1918	.....	....
Rhode Island	1914-15	1918	1918-19	1922
South Carolina	.....	....	1918-19	1922
South Dakota	1908-09	1912	1911-12	1915
Tennessee	1916-17	1920	1918-19	1922
Texas	1914-15	1918	.....	....
Utah	1913-14	1917	1922-23	1926
Vermont	1913-14	1917	1918-19	1922
Virginia	1914-15	1918	1917-18	1921
Washington	1914-15	1918	1918-19	1922
West Virginia	1917-18	1921	1920-21	1924
Wisconsin	.....	....	1915-16	1919
Wyoming†	.....	....	.....	....

* Require a four-year high school education or its equivalent.
† No fixed standard.

GRADUATE COURSES IN PUBLIC HEALTH

Graduate courses in public health have been established in connection with eleven medical schools, the first of which was at the University of Pennsylvania in 1909; the latest is that in connection with the medical department of the Johns Hopkins University, which began its course in 1918. Yale University established its course in public health in 1917. Two institutions, the University of Colorado and Tulane University, suspended their course in 1918. Six of the schools have courses leading to the degree of Doctor of Public Health (Dr.P.H.) after a two-year course. The University of California offers instead the degree of Graduate in Public Health (Gr.P.H.) after a two-year course. After a one-year course the degree of Certified Sanitarian (C.S.) is offered by the University of Pennsylvania to graduates of colleges of arts and sciences. Yale University grants a certificate in public health (C.P.H.) after a one-year course. The degree of Master of Public Health (M.P.H.) is offered after a one-year course by the Detroit College of Medicine and Surgery and the University of Wisconsin Medical School. The Master in Arts in Public Health [M.A. (P.H.)] is offered by the University of California Medical School, and the Master in Science in Public Health [M.S. (P.H.)] by the University of Michigan. The courses offered by the eight schools of public health are as follows:

THE UNIVERSITY OF CALIFORNIA: Courses began in 1915; number of instructors, 20; three courses leading to degree of Gr.P.H.: (a) a four year course covering three years in the college of letters and science and one year in the medical school; (b) a two year course covering one year in the college of letters and science and one year in the medical school for graduates of the college of civil engineering who have completed the work in sanitary engineering, and (c) a course of one and a half years, including one year in the college of letters and science, and a half year in the medical school for students who have completed three and a half years of the medical course. Completion of this third course gives the degrees of M.D. and Gr.P.H. The University of California also offers a one year course to graduates in arts or sciences for the degree of Master in Arts in Public Health [M.A. (P.H.)]. Fees are $150 each year. A thesis is required for the degree. The course extends from August to May.

YALE UNIVERSITY GRADUATE COURSE IN PUBLIC HEALTH.—The graduate course in public health at Yale University School of Medicine was first established in 1917, and during 1920-1921 there were thirteen instructors. A one-year course leads to the certificate in public health (C.P.H.), a two-year course leads to the degree of doctor of philosophy (Ph.D.), and to medical graduates only, a two-year course leads to the degree of doctor of public health (Dr.P.H.). Theses are required in all cases. The fees are $200 per year. The course extends from October to June. During 1920-1921, 19 students were enrolled, and in June, 1921, 1 certificate and 1 degree were granted.

JOHNS HOPKINS UNIVERSITY SCHOOL OF HYGIENE AND PUBLIC HEALTH was opened in October, 1918. There are 12 professors and 33 lecturers, associates and instructors, a total of 45. Four courses are offered: (a) A two year course leading to the degree of Dr.P.H., requiring for admission a bachelor's degree and a degree in medicine. The degree of M.D. and the degree of Dr.P.H. may be obtained in a combined course of five years. A thesis is required for graduation. (b) A three year course leading to the degree of Doctor of Science in Hygiene requiring for admission a bachelor's degree and adequate training in physics, chemistry, biology and the medical sciences, anatomy, physiology and pathology. A written and oral examination and a dissertation embodying the results of an independent investigation are required for graduation. (c) A two year course leading to the degree of Bachelor of Science in Hygiene, the course consisting of combined work in the medical school and the School of Hygiene and Public Health. For admission the applicant must have completed at least two years of work in an approved college and have studied courses in physics, biology, inorganic and organic chemistry. (d) A one year course leading to a certificate in public health is also offered to graduates of approved medical schools or graduates in arts or sciences who present evidence of satisfactory training in the physical and medical sciences. The fees charged are $250 per year. Courses for special students are $50 per trimester. Altogether 122 students were enrolled during 1920-1921, including 52 who were candidates for degrees and 4 for the certificate in public health. The course extends from October 4 to June 20.

MEDICAL SCHOOL OF HARVARD UNIVERSITY: The School of Public Health was opened in 1910; there are 42 instructors. A one year course is offered leading to a certificate in public health. For admission the applicant must have completed two years of work in a recognized medical school, or have received a bachelor's degree from an approved college or technical school, or have had special experience in public health work. In any instance he must show evidence of having completed satisfactory courses in physics, chemistry and biology and modern languages and the fundamental medical sciences. Although not a prerequisite, all candidates are advised to obtain a medical degree before specializing in public health work. Fees are $250 per year. Students enrolled in 1920-1921, 39; certificates in public health awarded, 12. Course extends from October to June.

DETROIT COLLEGE OF MEDICINE AND SURGERY: The course began in 1913 with ten instructors. A one year course leading to the degree of Master of Public Health (M.P.H.) is offered to graduates of approved medical schools. The work is conducted at the college, the Detroit City Board of Health, and the Municipal Contagious Hospital. It includes sanitary engineering, laboratory, clinical and field work. Fees are $100 per year. No thesis required. No students enrolled during the past session. The course extends from September to June.

THE UNIVERSITY OF MICHIGAN GRADUATE SCHOOL: The graduate courses in public health were established in the University of Michigan in 1913. The number of instructors is approximately 10. Two courses are offered—one to graduates in arts and sciences or medicine extending from one to two years, leading to the degree of Master of Science in Public Health; the other a course of from two to three years in length for graduates in arts or sciences and medicine, leading to the degree of Doctor of Public Health. For residents of Michigan the fees consist of $10 matriculation and $82 for men students and $77 for women; for nonresidents of Michigan, matriculation $25 and an annual fee of $107 for men and $102 for women. A thesis is required for the degree of Dr.P.H. There is a summer session but the regular session extends from September 27 to June 19. In 1920-1921 2 students were enrolled.

ALBANY MEDICAL COLLEGE: The graduate course in public health was begun in 1920. At the end of the year (in 1921), certificates were granted to 19 students, who had completed the course.

UNIVERSITY AND BELLEVUE HOSPITAL MEDICAL COLLEGE: The graduate course in public health began in 1916. Two courses are offered—a two years course leading to the degree of Doctor of Public Health for graduatesa of approved medical schools, and a correspondence course of indefinite length, especially adapted for health officers. The tuition for Dr.P.H. course is $200 for the first year aa nd$25 for the second. The fee for either the correspondence or the week's resident course is $30, including the matriculation fee. For the correspondence course the last week must be spent in residence. The courses run from October to June. There were 87 health officers who took the correspondence course last year.

THE UNIVERSITY OF PENNSYLVANIA: The graduate courses in public hygiene began in 1906; there are 19 instructors; two courses are offered, —a two years' course for graduates in medicine, leading to the degree of Dr.P.H. and a one year course for graduates of arts or science leading to the degree of Certified Sanitarian. A thesis is required for graduation. The fees are $250 per year. There were 5 students during 1920-1921; 1 graduate. The course extends from October to June.

THE UNIVERSITY OF WISCONSIN: Graduate courses in public health began in 1910. There are eight teachers. Two courses are offered—a one year course for graduates in medicine, leading to the degree of Master of Public Health (M.P.H.); the other a two year course for physicians, leading to the degree of Doctor of Public Health. Fees are $50 per year for residents of Wisconsin and $170 for nonresidents. A thesis is required for graduation. No students were registered during 1920-1921. Address inquiries to Miss Irene Brewster, Secretary, Medical School.

Uniform Requirements Since 1920-21

At a conference of representatives from a number of universities in the country held at New Haven, Conn., on Feb. 28, 1919, the following regulations were adopted to take effect with the Session 1920-1921:

1. That the degree of Doctor of Public Hygiene (for which the abbreviation shall be Dr.P.H.) for graduates in medicine shall be awarded after two years of work done under academic direction, of which one year at least shall be in residence, and that the requirements for the degree shall include class work, practical field work, and an essay based on individual study of a particular problem.

2. That the degree Doctor of Philosophy or Doctor of Science in Public Hygiene shall be conferred on students who hold the bachelor's degree from a college or technical school of recognized standing, and have satisfactorily completed not less than three years of graduate study. It is understood that this degree is based on a knowledge of physics, chemistry, biology, anatomy, physiology, physiologic chemistry, pathology and bacteriology.

GRADUATE COURSES IN MEDICAL SCHOOLS

Special correspondence with medical schools shows that there are many opportunities for graduate study which physicians have not been able to take advantage of through the lack of knowledge in regard to them. The following list has been prepared to correct this deficiency. More complete information can be obtained by correspondence with the medical school concerned.

CALIFORNIA

LELAND STANFORD JUNIOR UNIVERSITY SCHOOL OF MEDICINE, San Francisco.—Graduate courses are open to physicians: (a) Mid-day clinics, 11:30 to 12:30 daily, covering medicine, medical specialties

surgical specialties, obstetrics, gynecology and pathologic conferences free of charge. (b) Clinical demonstrations at the San Francisco Hospital. On Thursdays beginning at 9 a. m., the work is in surgery and the surgical specialties; on Fridays, beginning 9 a. m., medicine and the medical specialties. These courses are free of charge. (c) Assistantships in clinics and laboratories. A physician may be assigned to some research problem or receive regular instruction from a member of the staff. For the latter an appropriate fee is charged and a nominal fee also for material used. During the last five years an average of 28 physicians each year has occupied these assistantships.

UNIVERSITY OF CALIFORNIA MEDICAL SCHOOL.—Resident positions are open to properly qualified medical graduates as follows: In the University Hospital: A resident position in general medicine and four assistant residentships, one each in general medicine and dermatology; in neuropsychiatry and infirmary; in out-patient department; in medical research. Besides a residentship in surgery, there are five assistant residentships, one each in general surgery, urology, orthopedic surgery, opthalmology, otorhinolaryngology, outpatient department and surgical pathology, There are a residentship and two assistant residentships each in pediatrics and in obstetrics and gynecology. There is one residentship each in pathology and in biochemistry and clinical laboratories. In the San Francisco Hospital as house officers there are two positions in medicine and tuberculosis; two in surgery; one in pediatrics and isolation and one in obstetrics and gynecology. Special courses to physicians and advanced students are open in the departments of anatomy (at Berkeley) neuro-surgery, pathology, and research medicine. An announcement regarding public health work appears in another column.

COLORADO

UNIVERSITY OF COLORADO SCHOOL OF MEDICINE, Boulder-Denver.—During the present summer, courses for physicians were given in bacteriology, biochemistry, blood chemistry, anatomy, histology, embryology, clinical laboratory technic, advanced pathology and ophthalmology. The session extended from June 13 to August 27, divided in two terms. Physicians may register for either term or for the entire quarter.

ILLINOIS

RUSH MEDICAL COLLEGE, Chicago.—The following courses are offered for physicians: (a) A course on tuberculosis. (b) Special course for three or four physicians who are willing to spend a full year in diseases of the ear, nose and throat. (c) Attendance at arena clinics for which a visitor's ticket for a week is issued—registration not limited. (d) Opportunities for a few physicians for investigative work in the sciences fundamental to medicine, including pathology. Fees: $25 for each major's work, or $75 for a full quarter.

UNIVERSITY OF ILLINOIS COLLEGE OF MEDICINE, Chicago.—The summer quarter is devoted to graduate work and courses for physicians, and during the balance of the year a large number of fellowships are available in courses leading to the degrees of Master of Science and Doctor of Philosophy. Special opportunities for individual research work in anatomy, pharmacology, and pathology and bacteriology were offered during the present summer quarter.

INDIANA

INDIANA UNIVERSITY SCHOOL OF MEDICINE, Indianapolis.—At any time during the year special arrangements will be made for the physicians of Indiana who make application to receive instruction with the medical students or alone. During the summer a well arranged six weeks' course is offered to the physicians of Indiana in medicine, surgery, pathology (including immunology and bacteriology) and biochemistry.

IOWA

STATE UNIVERSITY OF IOWA COLLEGE OF MEDICINE, Iowa City.—During the present summer a four weeks' general clinical course limited to 12 physicians was offered. There are opportunities for physicians to act as clinical assistants, research workers, hospital chemists, etc., in the various departments of the medical school. Special opportunities are always open for physicians with research ability.

MARYLAND

JOHNS HOPKINS UNIVERSITY MEDICAL DEPARTMENT, Baltimore.—During the present summer a six weeks' course in medical diagnosis was offered, limited to twenty physicians. The course consisted in ward rounds, lectures, clinics group courses, physical diagnosis, laboratory work in clinical microscopy, and group clinics in the special study of syphilis. Provision can be made for similar classes in the other main departments of the medical college. Opportunities for advanced work open to a certain number of quaified men. The work is arranged for personal communication between the applicants and the heads of the various departments. Special opportunities for long time service in the hospital.

UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE, Baltimore.—Courses are open for physicians in anatomy, pathology, bacteriology, clinical laboratory, operative surgery, obstetrics, genito-urinary diseases, gynecology, roentgenology and pediatrics. Arrangements made by personal communication.

MICHIGAN

UNIVERSITY OF MICHIGAN MEDICAL SCHOOL, Ann Arbor.—The regular laboratory and clinical courses in the school are open to qualified physicians. In addition special work is arranged along all clinical and laboratory branches to meet the special needs of the applicant. Such courses may lead to the degrees of Master of Science or Doctor of Philosophy.

MISSOURI

WASHINGTON UNIVERSITY SCHOOL OF MEDICINE, St. Louis.—Washington University School of Medicine has established a series of post-graduate medical courses in all the various clinical branches. These courses make use of the laboratory, clinical and library facilities of the school and its allied hospitals. The courses are planned so as to run approximately six weeks, at stated intervals, and to consist of subjects so grouped as to furnish the student a comprehensive training in the work he selects. This is accomplished by combining with the major subjects numerous fundamentally related subjects of lesser, though vital, importance. In addition to these combined courses, detached courses are offered, thus affording students a wide range of selection. A descriptive pamphlet is available for all applicants who request it by addressing the Dean.

NEBRASKA

UNIVERSITY OF NEBRASKA COLLEGE OF MEDICINE, Omaha.—A special two weeks' course for practitioners is offered each June. Subjects include bedside clinics, physical diagnosis, clinical diagnosis, new developments in medicine and surgery. University Hospital and out-patient departments utilized.

NEW YORK

LONG ISLAND COLLEGE HOSPITAL, Brooklyn.—Positions comparable to fellowships open for physicians who have completed internships. These are in several clinical departments of the hospital. Courses open in fundamental branches; courses also open in embryology, neuro-anatomy, histology, bacteriology, biochemistry, physiology, preventive medicine and hygiene. Also opportunities for research work in biochemistry and physiology. Special courses on animal locomotion, heart and circulation, and funtional diseases. Opportunities also for physicians to advanced work. Post-graduate courses in anatomy, physiology, genito-urinary, surgery, medicine, bacteriology, biochemistry, obstetrics and gynecology, oto-laryngology, pediatrics and pathology are offered annually for six weeks from May 15. Arrangements made by personal communication.

UNIVERSITY AND BELLEVUE HOSPITAL COLLEGE OF MEDICINE.—Various graduate courses are open for physicians as follows: Research courses in anatomy, embryology, chemistry, physiology, pharmacology and therapeutics as well as special courses in pathology, bacteriology and surgery. Clinical courses occupying about six weeks each are also offered in medicine and physical diagnosis, clinical and operative gynecology, genito-urinary diseases, laryngology, ophthalmology, pediatrics and dermatology.

OHIO

WESTERN RESERVE UNIVERSITY SCHOOL OF MEDICINE, Cleveland.—Special review courses for physicians in medicine and surgery, including some of the specialties, during May and June of each year. Courses limited to 20 men. An effort is made to occupy the physician's entire time from 8 a. m. to 5 p. m. During the remainder of the year arrangements may be made with individual instructors for advanced research work in clinical and laboratory subjects. For information address the registrar.

VIRGINIA

MEDICAL COLLEGE OF VIRGINIA, Richmond.—Opportunities open for a few physicians to take courses in the combined laboratories of the college, of the State Board of Health and of the Richmond City Board of Health.

ONTARIO

UNIVERSITY OF TORONTO, FACULTY OF MEDICINE, Toronto.—Graduate courses in clinical and laboratory work are available to physicians on application. During the last session, two short courses were given for physicians, covering intensively one of the subjects of medicine, surgery, obstetrics and gynecology, ophthalmology and oto-laryngology. The summer course in pediatrics was repeated. Several series of lectures were delivered before medical societies throughout Ontario in addition to a large number of single lectures.

GRADUATE MEDICAL SCHOOLS

There are now eighteen graduate medical schools in the United States. These are commonly referred to as post-graduate medical schools. Of these institutions, seven are connected with universities in which the graduate teaching is, or will be, as thoroughly and scientifically given as are the courses of the undergraduate medical school. The universities having graduate schools are the Universities of Alabama, California, Tulane, Harvard, Minnesota, Columbia and Pennsylvania. The University of Chicago has received a generous endowment preparatory to the establishing of a large graduate school. Active steps toward this end will be taken in the near future. Following is the complete list of graduate medical schools:

ALABAMA

GRADUATE SCHOOL OF MEDICINE OF THE UNIVERSITY OF ALABAMA, Ave. F and 20th St., Birmingham. Organized 1915. Formerly the Birmingham Medical College. Suspended in 1918; reopens in fall of 1921. The dean is Dr. Lewis C. Morris, Empire Bldg.

CALIFORNIA

SAN FRANCISCO POLYCLINIC AND POST-GRADUATE SCHOOL, 1535 Jackson St., San Francisco. The dean is Dr. H. D'Arcy Power.

GRADUATE SCHOOL OF MEDICINE OF THE UNIVERSITY OF CALIFORNIA, Buena Vista and Alpine St., Los Angeles. Organized 1914. Formerly the University of Southern California College of Medicine. The dean is Dr. George H. Kress.

ILLINOIS

CHICAGO POLYCLINIC, 219-221 W. Chicago Ave., Chicago. The secretary is Dr. Malcolm L. Harris, 32 N. State St.

ILLINOIS POST-GRADUATE MEDICAL SCHOOL, 1844 W. Harrison St., Chicago. The secretary is Dr. James A. Clark.

POST-GRADUATE MEDICAL SCHOOL, 2400 Dearborn St., Chicago. The secretary is Dr. Emil Ries, 77 E. Washington St.

CHICAGO EYE, EAR, NOSE AND THROAT COLLEGE, 235 W. Washington St., Chicago. The secretary is Dr. John R. Hoffman, 31 N. State St.

PROVIDENT HOSPITAL POST-GRADUATE SCHOOL, 16 W. 36th St., Chicago. For colored physicians. The dean is Dr. George C. Hall.

LOUISIANA

NEW ORLEANS POLYCLINIC. Post-Graduate School of Medicine of the Tulane University of Louisiana, Tulane Ave. and Liberty St., New Orleans. The dean is Dr. Charles L. Chassaignac.

NEW ORLEANS POST-GRADUATE SCHOOL OF MEDICINE, 135 S. Rampart St., New Orleans. The secretary is Dr. Joseph A. Danna.

MASSACHUSETTS

HARVARD MEDICAL SCHOOL, COURSES FOR GRADUATES, 240 Longwood Ave., Boston. Organized as a separate division of the Medical School, 1912; all instructions under the charge of the Faculty of Medicine. Instruction is given throughout the year. The officer in charge is the assistant dean.

MINNESOTA

UNIVERSITY OF MINNESOTA GRADUATE SCHOOL OF MEDICINE, Minneapolis. Organized 1914. In 1915, the resources and facilities of the Mayo Foundation were added, with the staff, clinics, laboratories, library and records at Rochester, Minn. A nine months' course of advanced work is offered in the science departments giving the fundamental training essential in opthalmology and oto-laryngology, will begin Sept. 28, 1921. It will include anatomy, embryology and histology of the sense organs and of the head region; physiologic optics; physiology of the special senses and of speech; pathology and bacteriology as applied to the eye, ear, nose and throat. The course will include lectures, demonstrations, quizzes and clinical work in the outpatient department. The course is limited to ten students. There are also two teaching fellowships, each available in internal medicine, surgery, obstetrics, ophthalmology and oto-laryngology, pediatrics, and mental and nervous diseases. Five others are available in the laboratory sciences, and eighty-six others are available under the Mayo Foundation. Courses in various specialties leading to higher degrees in medicine (M.A., M.S., Ph.D.). Instruction throughout the year. The dean is Guy Stanton Ford, Ph.D., Minneapolis.

NEW YORK

The New York Association for Medical Education is organized to collect information regarding available graduate medical instruction; to work for the improvement of existing courses and the establishment and development of new opportunities for advanced study; to bring about an affiliation between medical schools and hospitals whose facilities have not before been utilized for teaching purposes; and to serve as a bureau of information and assistance to prospective students. The executive offices are at the Academy of Medicine Bldg., 17 W. 43d St., New York. The graduate schools are as follows:

NEW YORK POST-GRADUATE MEDICAL SCHOOL, 2d Ave. and 20th St., New York City. The secretary is Dr. J. Bentley Squier.

NEW YORK POLYCLINIC MEDICAL SCHOOL, 341-51 W. 50th St., New York City. Is to be taken over and the work developed by Columbia University. The president is Dr. John A. Wyeth, 341 W. 50th St.

MANHATTAN EYE, EAR AND THROAT HOSPITAL AND MEDICAL SCHOOL, 210 E. 64th St., New York City. The secretary is Dr. Samuel J. Kopetzky.

SCHOOL OF OPHTHALMOLOGY AND OTOLOGY, 13th St. and 2d Ave., New York City. The secretary is Dr. George S. Rixon, 40 E. 41st St.

COLLEGE OF THE NEW YORK OPHTHALMIC HOSPITAL, 23d St. and Third Ave., New York City. The secretary is Dr. W. C. McKnight, 13 Central Park West.

PENNSYLVANIA

GRADUATE SCHOOL OF MEDICINE OF THE UNIVERSITY OF PENNSYLVANIA, Philadelphia. Organized 1916 by a merger with the University of the Medico-Chirurgical College of Philadelphia. The Philadelphia Polyclinic was merged in 1918. The faculty includes about 230 teachers. Courses extending over from four to twelve months in medicine, pediatrics, neurology, dermatology, syphilology, roentgenology, surgery, gynecology, obstetrics, orthopedics, urology, proctology, opthalmology, oto-laryngology and the medical sciences. Fees: Four month courses, $200; eight month, $400; twelve month, $600. Special schedules (few only), special fees. The dean is Dr. George H. Meeker.

CHOICE OF A MEDICAL SCHOOL

For the student who has decided to study medicine the first and most important step is the selection of a medical school; a false step here may handicap him for life.

Before choosing a medical school the student should obtain information in regard to its requirements of preliminary education; the character of its teaching; its classification; the tuition fees charged and—most important—whether or not its diplomas are recognized by all state medical boards.

ADEQUATE ENTRANCE QUALIFICATIONS

The student should make sure that his preliminary education is sufficient to meet the requirements of the state licensing boards of the country. He should know that at the present time thirty-six[1] state licensing boards (73 per cent.) require that before beginning the study of medicine the student must have completed *two years* of work in an approved college of liberal arts, in addition to a four-year high school education.[2] Although he may not at first seek a license in one of these thirty-five states, he may later miss a great opportunity by being thus debarred. He should know also that all the better medical colleges now require this higher preliminary education, since—most important of all—the student needs it to understand and master the difficult and complex subjects of the modern medical college course. Lower entrance requirements by any medical college, therefore, should be regarded as an indication that the medical training furnished will be correspondingly low.

BETTER MEDICAL TRAINING ESSENTIAL

Medicine is now based on scientific knowledge, without which any physician will be seriously handicapped. Adequate instruction in the recognition, treatment and prevention of diseases can be given only in acceptable (Class A) medical schools, which have expert teachers, well-equipped laboratories, and dispensaries and hospitals where the student at the bedside can study patients having all varieties of sickness and injuries.

IS THE MEDICAL COLLEGE RECOGNIZED?

Formerly a course in almost any medical college furnished an adequate qualification for the license to practice medicine in all states. At present, however, state licensing boards are refusing to recognize medical colleges which are deemed not properly equipped to furnish a training in modern medicine. The student should know that the diplomas granted by some medical schools are not recognized in as high as from 40 to 46 states.[3] A diploma from one of these medical colleges, therefore, would not qualify him to practice medicine in any of those states. The student must make sure, not only that he has adequate preliminary education, but also that he has secured his medical training in a college recognized in all states.

CONSIDER CAREFULLY THE COST

The student, of course, is bound to consider the expense of his medical training, and herein lies the bait by which some inferior colleges which profess deep interest in "the poor boy" endeavor to attract students. If the training is not thorough and up to date, the student should know that the training furnished will be a mighty poor investment at any price. As a matter of fact, and as may be noted in Table 1, (opp. p. 25), the total fees charged by some of the best (Class A) medical colleges, particularly the medical departments of some state universities, are lower than those charged by some of the poorly equipped (Class C) institutions which are not recognized by the majority of state licensing boards.

In the same length of time, therefore, and often for even lower fees than he would pay in a poorly equipped institution, the student may acquire his education in one of the best medical colleges of the land. Although some of the better schools do charge higher fees, they spend on each student per year several times the amount of money that the student pays for tuition. This they are able to do because of their larger incomes from endowments or state aid. It would be poor economy, therefore, for a student to enter a low-grade college whose diplomas are not recognized in the majority of states, when for a few additional dollars each year he can enter a thoroughly equipped institution, receive a far better medical training and obtain a diploma recognized everywhere. Even if one should be required to work one's way through, in whole or in part, the opportunities for doing so are usually more abundant in the better than in the lower standard colleges.

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1. These states are listed on page 537.
2. The courses required and recommended in the high school and two-year premedical college courses are set forth on pages 541-542.
3. See Table D in THE JOURNAL A. M. A., April 30, 1921, page 1240.

As a rule, however, the student who works his way through college appreciates not only the value of money, but also the value of the medical course he is getting, and many such students are found in the high-grade medical colleges. There are now over 300 free scholarships, as well as generous loan funds, available for deserving students in the better medical colleges.[4]

GET RELIABLE INFORMATION

How may the student secure reliable information on these matters? Some medical colleges advertise extensively in newspapers and popular magazines and through announcements and circulars containing exaggerated, if not misleading, statements. *Of course, such advertisements do not show the more important fact that their diplomas are reported as not recognized in from 40 to 46 states.* It is essential, therefore, that the student should secure information from impartial and reliable sources, so as to make sure he is not enticed into a low-grade institution. To inform himself thoroughly, therefore, he should not depend alone on the announcements of the medical schools. After extensive and repeated investigations the medical schools of the country have been rated by the Council in three classes, namely, A, B and C, according to their degree of excellence.[5] If the student is otherwise in doubt, he will not make a mistake by choosing one of the colleges in Class A. By so doing he will not only obtain a better training in medicine but also, after graduation, will be eligible to secure a license in any state he may choose.

A STRONG AND SURE FOUNDATION

In his preliminary and medical education the student should bear in mind that he is *laying the foundation for the rest of his life.* If he finds that additional preliminary education is needed to enter one of the better medical colleges, he should consider the time well spent, since he is all the more sure of having laid a solid foundation. Although all professions in this country are crowded, there is always room for the thoroughly competent. On the other hand, the student will be disappointed if, because of lower entrance requirements or other allurements, he is induced to get his training in a poorly equipped college and finds after graduation that his diploma is not recognized in many states, and that otherwise he is handicapped for life.

AVOID CULTS AND FADS

Among the worst pitfalls confronting the present day student is the number of institutions representing various unscientific, or pseudo-scientific cults, such as osteopathy, chiropractic, etc., which profess to train those who desire to treat human ailments.[6] Medical knowledge is now based on scientific facts and there is no longer room for the differences of opinion which in earlier days were justifiable. Our medical schools are now the medical departments of universities of long established reputation—the best evidence that medicine as taught in medical schools is recognized as reliable. The theories advanced by osteopaths, chiropractors and other unscientific fads, however, have received no such endorsements and there is no acceptable proof of their having a reliable foundation. No one can afford to confine his training to the narrow theories held by any cult but should obtain a thorough, all-around scientific training by which he will be prepared to care intelligently for any form of human ailment or disorder which presents itself and to apply skillfully any form of treatment which each particular patient may require. One must have a thorough training in *all the fundamentals of medicine* before he can intelligently employ any particular method of treatment, even as the member of an orchestra must have a thorough training in all the fundamentals of music before he can play any particular instrument in that orchestra. One must first become a good general practitioner of medicine; then if he wishes to specialize along any particular line he will naturally secure further training for such specialty.

4. A list of colleges which provide scholarships and loan funds will be found on page 537.

5. See classification on page 544.

6. Special pamphlets, bearing on the various pseudo-medical or so-called "drugless" cults, will be furnished on application.

STANDARDS OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

SCHEDULE FOR GRADING MEDICAL SCHOOLS

After careful inspection, medical schools are rated on a civil service basis on a scale of 100 points. Data relating to each school will be grouped under four general heads in such manner that the groups will have as nearly equal importance as possible, each group being allowed a possible 25 points. The revised schedule under the four general heads is as follows:

1. FACULTY.—Number; qualifications (standing in profession, evidences of special training, teaching experience, etc.); research ability; efficiency; proportion of time to teaching; proportion to student enrolment; organization of departments; completeness of department staffs, including dieners, employees, etc.; esprit de corps.

2. PRODUCT.—Qualifications of students admitted; student organizations; esprit de corps; records of graduates before state and national boards; research; articles written; excellence as teachers; membership in medical organizations; reputation in profession; other evidences of character of training; reputation of college.

3. ADMINISTRATION AND SUPERVISION.—Curriculum: grade of course; sequence of subjects; arrangement of subjects in class roster and by departments in annual announcements; completeness of curriculum. Division of students in sections, ward classes, etc. Efficiency of routine. Faculty meetings. Supervision of entrance requirements, of teaching in college and in dispensary and hospital. Records: entrance requirements; class grades; promotion of students; dispensary and hospital records; attendance of teachers and students; conditions, etc.; completeness. Budget: use made of funds; proportion to salaries, etc.

4. BUILDINGS AND EQUIPMENT.—College building, including class rooms, laboratories, library, museum, storage rooms, animal houses and their contents. Dispensary: rooms used for; accessibility; number and regularity of staff; quantity and use of clinical material; character of histories and records. Hospital: accessibility; ownership or control; quantity, variety and use of clinical material. Other equipment. Apparatus. Funds: in addition to students' fees; endowed chairs, fellowships, etc.

Medical schools containing 70 per cent. or above are rated in Class A, those obtaining from 50 to 70 per cent. in Class B, and those obtaining 50 per cent. or less in Class C.

MEANING OF CLASSES A, B AND C

Class A Colleges are those which are acceptable; Class B, those which, under their present organization, give promise of being made acceptable by general improvements, and Class C those

(*a*) Which require a complete reorganization to make them acceptable.

(*b*) Which do not keep satisfactory records of their students in regard to entrance requirements, attendance, grades in courses, division into classes and reasons for promotion.

(*c*) Which do not enforce their requirements in regard to admission (including those admitted to advanced standing), promotion and graduation.

(*d*) Which give the major portion of their instruction after 4 o'clock in the afternoon.

(*e*) Which are privately owned and conducted for profit.

(*f*) Which for other specific reasons are not eligible for inclusion in Class B.

ESSENTIALS OF AN ACCEPTABLE MEDICAL COLLEGE,

Revised to July 1, 1921

1. The minimum requirement for admission to an acceptable medical college is a four-year high school education or its full equivalent and two years of work in a college of arts and sciences approved by the Council on Medical Education and Hospitals, as follows:

I. HIGH SCHOOL REQUIREMENTS

(*a*) For admission to the two-year premedical college course, students shall have completed a four-year course of at least fifteen units in a standard accredited high school or other institution of standard secondary school grade, or have the equivalent as demonstrated by examinations conducted by the College Entrance Examination Board, or by the authorized examiner of a standard college or university approved by

the Council on Medical Education and Hospitals. A detailed statement of attendance at the secondary school, and a transcript of the student's work, should be kept on file by the college authorities. This evidence of actual attendance at the secondary schools should be obtained, no matter whether the student is admitted to the freshman or to higher classes.

(*b*) Credits for admission to the premedical college course may be granted for the subjects shown in the following list and for any other subject counted by a standard accredited high school as a part of the requirements for its diploma, provided that at least eleven units must be offered in Groups I-V:

SCHEDULE OF SUBJECTS REQUIRED OR ACCEPTED FOR ENTRANCE TO THE PREMEDICAL COLLEGE COURSE

Subjects	Units *	Required
GROUP I, ENGLISH—		
Literature and composition	3-4	3
GROU II, FOREIGN LANGUAGES—		
Latin	1-4	2†
Greek	1-3	
French or German	1-4	
Other foreign languages	1-4	
GROUP III, MATHEMATICS—		
Elementary algebra	1	1
Advanced algebra	½-1	..
Plane geometry	1	1
Solid geometry	½	..
Trigonometry	½	..
GROUP IV, HISTORY—		
Ancient history	½-1	1
Medieval and modern history	½-1	
English history	½-1	
American history	½-1	
Civil government	½-1	
GROUP V, SCIENCE—		
Botany	½-1	..
Zoology	½1-	..
Chemistry	1	..
Physics	1	..
Physiography	½-1	..
Physiology	½-1	..
Astronomy	½	..
Geology	½-1	..
GROUP VI, MISCELLANEOUS—		
Agriculture	1-2	..
Bookkeeping	½-1	..
Business law	½	..
Commercial geography	½-1	..
Domestic science	1-2	..
Drawing, freehand and mechanical	½-2	..
Economics and economic history	½-1	..
Manual training	1-2	..
Music: Appreciation or harmony	1-2	..

* A unit is the credit value of at least thirty-six weeks' work of four or five recitation periods per week, each recitation period to be not less than forty minutes. In other words a unit represents a year's study in any subject in a secondary school constituting approximately a quarter of a full year's work. A satisfactory year's work in any subject cannot be accomplished under ordinary circumstances in less than 120 sixty-minute hours, or their equivalent.

† Both of the required units of foreign language must be of the same language, but the two units may be presented in any one of the languages specified.

Of the fifteen units of high school work, eight units are required, as indicated in the foregoing schedule; the balance may be made up from any of the other subjects in the schedule.

II. PREMEDICAL COLLEGE COURSE

(*c*) The minimum requirement for admission to acceptable medical schools, in addition to the high school work specified above, will be sixty semester hours of collegiate work, extending through two years, of thirty-two weeks each, exclusive of holidays, in a college approved by the Council on Medical Education and Hospitals. The subjects included in the two years of college work should be in accordance with the following schedule:

SCHEDULE OF SUBJECTS OF THE TWO-YEAR PREMEDICAL COLLEGE COURSE

Sixty Semester Hours* Required

Required Subjects:	Semester Hours
Chemistry (a)	12
Physics (b)	8
Biology (c)	8
English composition and literature (d)	6
Other nonscience subjects (e)	12
Subjects Strongly Urged:	
A modern foreign language (f)	6-12
Advanced botany or advanced zoology	3- 6
Psychology	3- 6
Advanced mathematics, including algebra and trigonometry	3- 6
Additional courses in chemistry	3- 6
Other Suggested Electives:	
English (additional), economics, history, sociology, political science, logic, mathematics, Latin, Greek, drawing.	

* A semester hour is the credit value of sixteen weeks' work consisting of one lecture or recitation period per week, each period to be not less than fifty minutes net, at least two hours of laboratory work to be considered as the equivalent of one lecture or recitation period.

SUGGESTIONS REGARDING INDIVIDUAL SUBJECTS

(*a*) *Chemistry.*—Twelve semester hours required of which at least eight semester hours must be in general inorganic chemistry, including four semester hours of laboratory work. In the interpretation of this rule work in qualitative analysis may be counted as general inorganic chemistry. The remaining four semester hours may consist of additional work in general chemistry or of work in analytic or organic chemistry. After Jan. 1, 1922, organic chemistry will be required.

(*b*) *Physics.*—Eight semester hours required, of which at least two must be laboratory work. It is urged that this course be preceded by a course in trigonometry.

(*c*) *Biology.*—Eight semester hours required, of which four must consist of laboratory work. This requirement may be satisfied by a course of eight semester hours in either general biology or zoology, or by courses of four semester hours each in zoology and botany, but not by botany alone.

(*d*) *English Composition and Literature.*—The usual introductory college course of six semester hours, or its equivalent, is required.

(*e*) *Nonscience Subjects.*—Of the sixty semester hours required as the measurement of two years of college work, at least eighteen, including the six semester hours of English, should be in subjects other than the physical, chemical or biologic sciences.

(*f*) *Foreign Language.*—A reading knowledge of a modern foreign language is strongly urged. French and German have the closest bearing on modern medical literature. If the reading knowledge in one of these languages is obtained on the basis of high school work, the student is urged to take the other language in his college course. It is not considered advisable, however, to spend more than twelve of the required sixty semester hours on foreign languages.

Recognition.—This two-year premedical course in both quantity and quality must be such as to make it acceptable as the equivalent of the first two years of the course in reputable, approved colleges of arts and sciences leading to the degree of Bachelor of Science.

APPROVED COLLEGES OF ARTS AND SCIENCES

A tentative list of colleges of arts and sciences approved by the Council on Medical Education and Hospitals has been prepared, and will be occasionally revised. By an approved college (of arts and sciences) is meant one whose standing has been vouched for by some standardizing agency in whose methods the Council has confidence.

PREMEDICAL COURSES IN MEDICAL COLLEGES—JUNIOR COLLEGES

Premedical college courses given in or by medical schools, by normal schools, or advance years taken in high schools, will not be considered as acceptable unless they have been investigated and approved by some association of colleges and secondary schools or other approved agency having to do with the standardizing of liberal arts colleges, and unless they are found to be a full equivalent of the first two years of the course leading to the Bachelor of Science degree.

III. THE MEDICAL SCHOOL

ADMINISTRATION OF ENTRANCE REQUIREMENTS

2. The admission of students to the medical school must be in the hands of a responsible committee or examiner whose records shall always be open for inspection. Documentary evidence of the student's preliminary education should be obtained and kept on file. When the medical school is an integral part of the university, this work usually devolves on

the university examiner. Unless the university examiner and his records are closely accessible, however, some officer at the medical school should obtain and keep on file documentary evidence of each student's preliminary education, including both high school and collegiate work. The records should show especially that the required amount of work in the premedical sciences, including laboratory experiments, has been completed.

OTHER MEDICAL SCHOOL REQUIREMENTS

3. The college should require that students be in actual attendance in the college *within the first week* of each annual session and thereafter.

4. Actual attendance at classes should be insisted on except for good cause, such as for sickness, and no credit should be given for any course where the attendance has been less than 80 per cent. of the full time.

5. (*a*) Full advanced standing may be granted to students only for work done in other acceptable medical schools, and in granting advanced standing there should be no discrimination against the college's full-course students. Official verification of the student's previous medical work should be obtained by direct correspondence with the college previously attended, and his preliminary qualifications should also be verified and recorded the same as for freshman students. (*b*) In *exceptional cases* students who possess the required premedical qualifications and who have completed three or more years of work in Class B medical schools may be given advanced standing but not higher than *entrance* to the third year (junior) class, and no credit should be given in any subject except on recommendation of the head of the department teaching that subject. (*c*) In *exceptional cases* also students who possess the required premedical qualifications and who have completed three or more years of work in Class C colleges may be given advanced standing but not higher than *entrance* to the second year (sophomore) class, and then only after thorough examinations in all first year subjects have been passed.

SUPERVISION, EQUIPMENT, TEACHERS

6. There should be careful and intelligent supervision of the entire school by the dean or other executive officer who holds, and has sufficient authority to carry out fair ideals of medical education as determined by the present day knowledge of medicine.

7. There should be a good system of records showing conveniently and in detail the credentials, attendance, grades and accounts of the students, by means of which an exact knowledge can be obtained regarding each student's work. Records should also be kept showing readily the attendance of patients at the teaching hospitals and dispensaries; the maternity cases attended by students, and the postmortem cases used in teaching.

8. The college curriculum should be fully graded and should cover four sessions of at least thirty-two weeks each, exclusive of time required for matriculation and holidays, and at least thirty hours per week of actual work. The courses offered in the various subjects should be set forth by departments (anatomy, physiology, etc.) in the annual announcement, showing for each course its number, subject, content, character (lecture, recitation, laboratory or clinic), length of time, when, where, and by whom given, and the amount of credit allowed. The courses for each class should also be clearly set forth in a printed class schedule, for the guidance of the students.

(*a*) The college should give two years of work consisting largely of laboratory work in well equipped laboratories of anatomy, histology, embryology, physiology, physiologic chemistry, bacteriology, pathology, pharmacology, therapeutics and clinical diagnosis. Present-day medical knowledge makes it essential that these subjects be in charge of full-time, well-trained teachers.

(*b*) Two years of clinical work, largely in hospitals and dispensaries, with courses in medicine (including physical diagnosis, pediatrics, nervous and mental diseases), surgery (including surgical anatomy and operative surgery on the cadaver), obstetrics, gynecology, laryngology, rhinology, ophthalmology, otology, dermatology, hygiene and medical jurisprudence. With the higher entrance requirements time is now available in the latter part of the second year for beginning courses in physical diagnosis and the principles of surgery.

(*c*) As soon as conditions warrant, relations should be established with a number of approved hospitals so that a fifth undergraduate year may be required to be spent by the student as an intern under the continued supervision of the medical school.

FACULTY

9. (*a*) The college should provide at least *eight expert thoroughly trained professors in the laboratory branches*, salaried so that they may devote their entire time to instruction and to that research without which they cannot well keep up with the rapid progress being made in their subjects.[7] For colleges having *sixty students or less* in each class, there should be at least one full-time salaried assistant each in the departments of (1) anatomy, (2) physiology, (3) pathology and bacteriology, and (4) physiologic chemistry and pharmacology. There should be also one additional assistant provided in each of these departments for *each additional thirty students enrolled*. This represents a low average of the full-time assistants already employed by the acceptable medical colleges.

(*b*) The faculty should be made up of graduates of institutions recognized as medical colleges and who have had a training in all departments of medicine. Nonmedical men should be selected as teachers in medical schools only under exceptional circumstances and only when medical men of equal special capacity are not available. The faculty should be organized, each department having its head professor, its associate professor, assistant professor, instructor, etc., each having his particular subjects for the teaching of which he is responsible to the head of the department.

CLINICAL FACILITIES AND INSTRUCTION

10. (*a*) The college should own or entirely control a hospital in order that students may come into close and extended contract with patients under the supervision of the attending staff. This hospital should be in close proximity to the college and have a daily average (for senior classes of 100 students or *less*) of not less than 200 patients who can be utilized for clinical teaching, these patients to be of such character as to permit the students to see and study the common variety of surgical and medical cases as well as a fair number in each of the so-called specialties. In the use of this material *bedside and ward clinics* should be developed for sections of from five to ten students, and for the seniors, a certain number of patients in medicine, surgery and the specialties should be assigned to each student under a well supervised clinical clerk system. The treatment and care of these patients should be particularly observed and recorded by the student under the strict supervision of the intern, or the attending staff of the hospital.

(*b*) The college should also have ample hospital facilities for children's diseases, contagious diseases and nervous and mental diseases.

(*c*) The college should own or control a dispensary, or outpatient department, the attendance to be a daily average of 100 patients (visits) (for senior classes of 100 students *or less*), the patients to be carefully classified, good histories and records of the patients to be kept and the material to be well used. The attending staff should be made up of good teachers, should be well organized and be prompt and regular in attendance.

7. These professors should have a definite responsibility in the conduct of the college, and their first and chief interest should be the training of medical students. It is suggested that four of these professors be placed at the head of the departments of (*a*) anatomy, (*b*) physiology and physiologic chemistry, (*c*) pathology and bacteriology, and (*d*) pharmacology and therapeutics. The other four might with advantage be assigned, one each, to (*e*) histology and embryology, under the department of anatomy, and to the department of (*f*) pathology and bacteriology, and (*g*) physiology and pharmacology, and to the departments of (*h*) either internal medicine or surgery.

(*d*) At least six maternity cases should be provided for each senior student, who should have actual charge of these cases under the supervision of the attending physician. Careful records of each case should be handed in by the student.

(*e*) Facilities should be provided for at least thirty necropsies (for senior classes of 100 students *or less*) during each college session which are attended and participated in by senior students. These, as a rule, should be in the teaching hospital controlled by the medical school and performed by the professor of pathology. The so-called clinical-pathologic conferences should be more widely developed in connection with the postmortems.

OTHER TEACHING FACILITIES AND FINANCES

11. The college should have a working medical library, to include the more modern text and reference books with the *Index Medicus*, the Surgeon-General's Index and other serviceable indexes. The library should receive regularly thirty or more leading medical periodicals, the current numbers of which should be in racks or on tables easily accessible to the students. At the end of each year these periodicals should be bound and added to the files of bound periodicals. The library room should be properly lighted and heated, and open during all or the greater part of the day; it should be equipped with suitable card indexes as well as with tables and chairs, and have a competent librarian in charge.

12. There should be a working medical museum having its various anatomic, embryologic, pathologic and other specimens carefully prepared, labeled and indexed so that any specimen may be easily found and employed for teaching purposes. It is suggested that so far as possible with each pathologic specimen coming from postmortems there also be kept the record of the postmortem, the clinical history of the patient on whom the necropsy was held and microscopic slides showing the minute structures of the disease shown in the gross specimen. The museum furnishes an excellent means of correlating the work of the department of pathology with that of the clinical departments.

13. There should be sufficient dissecting material to enable each student individually to dissect at least the lateral half of the human cadaver, to provide cross-sections and other demonstration material and to allow of a thorough course for each senior in operative surgery on the cadaver.

14. For modern experimental laboratory work in physiology, pharmacology and bacteriology as well as for medical research, a supply of animals—frogs, turtles, rabbits and guinea-pigs, if not also cats and dogs—is essential. Proper provision, also, is necessary for the housing and care of such animals. In any use made of animals every precaution should be taken to prevent needless suffering, and work by students should be carefully supervised.

15. Each college should have a supply of such useful auxiliary apparatus as a stereopticon, a reflectoscope, carefully prepared charts, embryologic or other models, manikins; dummies for use in bandaging, a roentgen-ray and other apparatus now so generally used in medical teaching.

16. The college should show evidences of thorough organization and of reasonably modern methods in all departments, and evidences that the equipment and facilities are *being intelligently used* in the training of medical students.

17. A clear statement of the college's requirements for admission, tuition, time of attendance on the classes, sessions, courses offered and graduation should be clearly set forth, together with complete classified lists of its matriculants and latest graduating class in regular annual catalogues or announcements.

18. Statistics show [8] that modern medicine cannot be acceptably taught by a medical school depending solely on the income from students' fees. No medical school should expect to secure admission to, or be retained in Class A, therefore, which does not have an annual income of at least $25,000 in addition to the amount obtained from students' fees.

8. See "Medical College Finances," J. A. M. A., April 8, 1916, p. 1115.

CLASSIFICATION OF MEDICAL COLLEGES

Revised to July 1, 1921

CLASS A—ACCEPTABLE MEDICAL COLLEGES

ARKANSAS

University of Arkansas Medical Department*[1]...Little Rock

CALIFORNIA

Leland Stanford Junior Univ. School of Med..San Francisco
University of California Medical School.....San Francisco

COLORADO

University of Colorado School of Med.....Boulder-Denver

CONNECTICUT

Yale University School of Medicine.....New Haven

DISTRICT OF COLUMBIA

Georgetown University School of Medicine.....Washington
George Washington University Medical School..Washington
Howard University School of Medicine[2].....Washington

GEORGIA

Emory University School of Medicine[3].....Atlanta
University of Georgia Medical Department[4].....Augusta

ILLINOIS

Loyola University School of Medicine[5].....Chicago
Northwestern University Medical School.....Chicago
Rush Medical College (University of Chicago).....Chicago
University of Illinois College of Medicine.....Chicago

INDIANA

Indiana Univ. School of Med.....Bloomington-Indianapolis

IOWA

State University of Iowa College of Medicine....Iowa City

KANSAS

University of Kansas School of Med.....Lawrence-Rosedale

KENTUCKY

University of Louisville Medical Department[6]....Louisville

LOUISIANA

Tulane Univ. of Louisiana School of Med.....New Orleans

MARYLAND

Johns Hopkins University Medical Department....Baltimore
University of Maryland School of Medicine and
the College of Physicians and Surgeons.....Baltimore

MASSACHUSETTS

Boston University School of Medicine.....Boston
Medical School of Harvard University.....Boston
Tufts College Medical School.....Boston

MICHIGAN

Detroit College of Medicine and Surgery[7].....Detroit
University of Michigan Medical School.....Ann Arbor
University of Mich. Homeopathic Med. School....Ann Arbor

MINNESOTA

University of Minnesota Medical School.....Minneapolis

MISSISSIPPI

University of Mississippi School of Medicine*.....Oxford

MISSOURI

St. Louis University School of Medicine.....St. Louis
University of Missouri School of Medicine*.....Columbia
Washington University Medical School.....St. Louis

NEBRASKA

John A. Creighton Medical College[8].....Omaha
University of Nebraska College of Medicine.....Omaha

NEW HAMPSHIRE

Dartmouth Medical School*.....Hanover

* Gives only the first two years of the medical course.
1. Raised to Class A, June 9, 1919.
2. Rating raised to Class A June 6, 1910.
3. Rating raised to Class A Feb. 24, 1914; formerly the Atlanta Medical College.
4. Class A rating restored Feb. 24, 1913.
5. Rating raised to Class A March 1, 1920.
6. Rating raised to Class A June 6, 1910.
7. Class A rating restored June 21, 1914.
8. Class A rating restored Feb. 4, 1917.

NEW YORK

Albany Medical College.....Albany
Columbia Univ. Coll. of Phys. and Surgs....New York City
Cornell University Medical College.....New York City
Long Island College Hospital*.....Brooklyn
Syracuse University College of Medicine.....Syracuse
University and Bellevue Hospital Med. Coll..New York City
University of Buffalo Department of Medicine.....Buffalo

NORTH CAROLINA

University of North Carolina School of Med.*...Chapel Hill
Wake Forest College School of Medicine*....Wake Forest

NORTH DAKOTA

University of North Dakota School of Medicine*..University

OHIO

Ohio State University College of Medicine.....Columbus
University of Cincinnati College of Medicine.....Cincinnati
Western Reserve University School of Medicine....Cleveland

OKLAHOMA

Univ. of Oklahoma School of Med.[10]..Norman-Oklahoma City

OREGON

University of Oregon Medical School.....Portland

PENNSYLVANIA

Hahnemann Medical College and Hospital.....Philadelphia
Jefferson Medical College of Philadelphia.....Philadelphia
University of Pennsylvania School of Med.....Philadelphia
University of Pittsburgh School of Medicine[11]....Pittsburgh
Woman's Medical College of Pennsylvania.....Philadelphia

SOUTH CAROLINA

Medical College of the State of South Carolina[12]..Charleston

SOUTH DAKOTA

University of South Dakota College of Medicine*..Vermilion

TENNESSEE

University of Tennessee College of Medicine[13].....Memphis
Vanderbilt University Medical Department.....Nashville

TEXAS

Baylor University College of Medicine[14].....Dallas
University of Texas Department of Medicine.....Galveston

UTAH

University of Utah School of Medicine*.....Salt Lake City

VERMONT

University of Vermont College of Medicine.....Burlington

VIRGINIA

Medical College of Virginia.....Richmond
University of Virginia Department of Med...Charlottesville

WEST VIRGINIA

West Virginia Univ. School of Medicine*[15].....Morgantown

WISCONSIN

Marquette University School of Medicine[16].....Milwaukee
University of Wisconsin Medical School*.....Madison

Total, 68.

CLASS B—COLLEGES NEEDING GENERAL IMPROVEMENTS TO BE MADE ACCEPTABLE

CALIFORNIA

College of Medical Evangelists[17]...Loma Linda-Los Angeles

ILLINOIS

Hahnemann Medical College and Hospital[18].....Chicago

NEW YORK

New York Homeopathic Medical College and Flower Hospital[19].....New York City

OHIO

Eclectic Medical College.....Cincinnati
Ohio State Univ. Coll. of Homeopathic Med[20].....Columbus

PENNSYLVANIA

Temple University Department of Medicine[21]...Philadelphia

TENNESSEE

Meharry Medical College[22].....Nashville

Total, 7.

CLASS C—COLLEGES REQUIRING A COMPLETE REORGANIZATION TO MAKE THEM ACCEPTABLE

ILLINOIS

Chicago Medical School[23].....Chicago

MASSACHUSETTS

College of Physicians and Surgeons[24].....Boston
Middlesex College of Medicine and Surgery[25]....Cambridge

MISSOURI

Kansas City University of Phys. and Surgs.[26]...Kansas City
St. Louis College of Physicians and Surgeons[27].....St. Louis

TENNESSEE

University of West Tenn. Coll. of Med. and Surg..Memphis

UNCLASSIFIED

University of Alabama School of Medicine.....Tuscaloosa

In 1920 this medical school was moved from Mobile to the campus of the University in Tuscaloosa where it is being reorganized as a two-year medical school. For the season of 1920-21 it enrolled only first year medical students for whom ample teachers, laboratories and equipment were provided. In the session for 1921-22 it is announced that both first-year and second-year students will be enrolled. The rating of the school is withheld until an inspection shall show that full provision for these two classes has been made.

Kansas City College of Medicine and Surgery...Kansas City

This college is an offshoot of another Class C institution, the Eclectic Medical University, which has since ceased to exist. The new college has refused to have inspections made, but an abundance of information on file indicates that no rating higher than Class C could be given it. It is reported as not recognized by the licensing boards of forty states, including its home state—Missouri.

Entrance Requirements of Medical Colleges

Seventy-seven medical schools are now requiring, as a minimum for entrance, *two years* or more of work in a college of liberal arts in addition to a four-year high-school education, and voluntarily submit reports to the Council by which the enforcement of their published requirements may be verified. The years when each college puts into effect, respectively, the one-year and the two-year requirements, and the rating of each college, are as follows:

College	One Year	Two Years	College Rating
ALABAMA			
University of Alabama School of Medicine.....	1914	1915	
ARKANSAS			
University of Arkansas Medical Department.....	1915	1918	A
CALIFORNIA			
College of Medical Evangelists.....	1914	1915	B
Leland Stanford Junior School of Medicine.....	....	1909	A
University of California Medical School.....	....	1905	A

* Gives only the first two years of the medical course.
9. Class A rating restored June 21, 1914.
10. Rating raised to Class A March 1, 1920.
11. Rating raised to Class A June 6, 1910.
12. Class A rating restored Feb. 6, 1916.
13. Rating raised to Class A June 21, 1914.
14. Rating raised to Class A June 12, 1916.
15. Class A rating restored Feb. 4, 1917.
16. Rating raised to Class A Feb. 15, 1915.
17. Rating raised to Class B Feb. 3, 1918.
18. Rating dropped to Class B June 3, 1912.
19. Rating dropped to Class B Feb. 15, 1915.
20. Rating raised to Class B Feb. 4, 1917.
21. Rating raised to Class B June 6, 1910.
22. Rating dropped to Class B Feb. 24, 1914.
23. Formerly the Chicago Hospital College of Medicine. Last inspected April 23, 1918.
24. Rated in Class C since 1907. Last inspected Jan. 7, 1918.
25. This is the medical department of the so-called "University of Massachusetts." It was rated in Class C Feb. 4, 1918.
26. Formerly the Central College of Osteopathy; in 1917 under an amended charter took the name of Central College Medical Department; assumed present title in 1918. Rated in Class C March 15, 1918.
27. Rating dropped to Class C July 1, 1909. In 1915 it merged with the Medical Department of the National University of Arts and Sciences, but in 1917 it was reestablished. In 1918 reported not recognized by the Missouri State Board of Health.

COLORADO			
University of Colorado School of Medicine	....	1910	A
CONNECTICUT			
Yale University School of Medicine	....	1909	A
DISTRICT OF COLUMBIA			
Georgetown University School of Medicine	....	1912	A
George Washington University Medical School	1914	1918	A
Howard University School of Medicine	1910	1914	A
GEORGIA			
Emory University School of Medicine, Atlanta	1914	1918	A
University of Georgia Medical Department	1914	1918	A
ILLINOIS			
Loyola University School of Medicine	1915	1918	A
Hahnemann Medical College and Hospital	1914	1916	B
Northwestern University Medical School	1908	1911	A
Rush Medical College (University of Chicago)	....	1904	A
University of Illinois College of Medicine	1913	1914	A
INDIANA			
Indiana University School of Medicine	1909	1910	A
IOWA			
State University of Iowa College of Medicine	1909	1910	A
KANSAS			
University of Kansas School of Medicine	....	1909	A
KENTUCKY			
University of Louisville Medical Department	1914	1918	A
LOUISIANA			
Tulane University of Louisiana School of Medicine	1910	1918	A
MARYLAND			
Johns Hopkins University Medical Department	....	1893	A
University of Maryland School of Medicine and College of Physicians and Surgeons	1914	1918	A
MASSACHUSETTS			
Boston University School of Medicine	1914	1916	A
Medical School of Harvard University	....	1900	A
Tufts College Medical School	1914	1918	A
MICHIGAN			
Detroit College of Medicine and Surgery	1914	1918	A
University of Michigan Medical School	....	1909	A
University of Michigan Homeopathic Medical School	1912	1916	A
MINNESOTA			
University of Minnesota Medical School	....	1907	A
MISSISSIPPI			
University of Mississippi School of Medicine	1914	1918	A
MISSOURI			
St. Louis University School of Medicine	1910	1918	A
University of Missouri School of Medicine	1906	1910	A
Washington University Medical School	1910	1912	A
NEBRASKA			
John A. Creighton Medical College	1914	1918	A
University of Nebraska College of Medicine	1908	1909	A
NEW HAMPSHIRE			
Dartmouth Medical School	....	1910	A
NEW YORK			
Albany Medical College	1914	1918	A
Columbia University College of Phys. and Surg.	....	1910	A
Cornell University Medical College	....	1908	A
Long Island College Hospital	1914	1918	A
New York Homeo. Med. Coll. and Flower Hospital	1915	1919	B
Syracuse University College of Medicine	1909	1910	A
University and Bellevue Hospital Medical College	1912	1918	A
University of Buffalo Department of Medicine	1914	1918	A
NORTH CAROLINA			
Wake Forest College School of Medicine	....	1908	A
University of North Carolina School of Medicine	1910	1917	A
NORTH DAKOTA			
University of North Dakota School of Medicine	....	1907	A
OHIO			
Eclectic Medical College	1915	1918	B
Ohio State University College of Medicine	1914	1915	A
Ohio State Univ. Coll. of Homeopathic Medicine	1915	1916	B
University of Cincinnati College of Medicine	1910	1913	A
Western Reserve University School of Medicine	....	1901	A
OKLAHOMA			
University of Oklahoma School of Medicine	1914	1917	A
OREGON			
University of Oregon Department of Medicine	1910	1915	A
PENNSYLVANIA			
Hahnemann Medical College and Hospital	1914	1917	A
Jefferson Medical College	1914	1917	A
Temple University Medical Department			B
University of Pennsylvania School of Medicine	1909	1910	A
University of Pittsburgh School of Medicine	1911	1913	A
Woman's Medical College of Pennsylvania	1914	1915	A
SOUTH CAROLINA			
Medical College of the State of South Carolina	1914	1916	A
SOUTH DAKOTA			
University of South Dakota College of Medicine	1908	1909	A
TENNESSEE			
Meharry Medical College	1914	1918	B
Vanderbilt University Medical Department	1914	1918	A
University of Tennessee College of Medicine	1914	1918	A
TEXAS			
Baylor University College of Medicine	1913	1918	A
University of Texas Department of Medicine	1910	1917	A
UTAH			
University of Utah School of Medicine	1909	1910	A
VERMONT			
University of Vermont College of Medicine	1912	1918	A
VIRGINIA			
Medical College of Virginia	1914	1915	A
University of Virginia Department of Medicine	1910	1917	A
WEST VIRGINIA			
West Virginia University School of Medicine	1911	1917	A
WISCONSIN			
Marquette University School of Medicine	1913	1915	A
University of Wisconsin Medical School	....	1907	A

Total, 76.

The eight following medical colleges either have not announced the higher entrance requirements or such evidence as has been received does not show they have been enforced for all students enrolled:

	Rating
Chicago Medical School	C
College of Physicians and Surgeons, Boston	C
Middlesex College of Medicine and Surgery, Cambridge, Mass.	C
Kansas City College of Medicine and Surgery	*
Kansas City University of Physicians and Surgeons	C†
St. Louis College of Physicians and Surgeons	C
Temple University Department of Medicine	C
University of West Tenn. Coll. of Med. and Surg., Memphis	C

* This college is an offshoot of the Eclectic Medical University; has refused to have an inspection made. It is reported not recognized by the Missouri State Board of Health and by licensing boards of 39 other states.

† This college was formerly the Central College of Osteopathy; in 1916 it assumed the title Central College Medical Department, and took its present name in 1918.

Hospital Intern Year

Ten medical colleges have adopted the requirement of a fifth year to be spent by the student as an intern in an approved hospital or in other acceptable clinical work before the M.D. degree will be granted. These colleges and the years when the requirement became effective for matriculants and graduates are as follows:

	Affects Matriculants	Affects Graduates
University of Minnesota Medical School	1910-11	1915
Leland Stanford Junior Univ. School of Med.	1914-15	1919
Rush Medical College (University of Chicago)	1914-15	1919
University of California Medical School	1914-15	1919
Northwestern University Medical School	1915-16	1920
Marquette University School of Medicine	1915-16	1920
University of Illinois College of Medicine	1917-18	1922
Loyola University School of Medicine	1917-18	1922
Coll. of Phys. and Surgs., Los Angeles	1918-19	1923
Detroit College of Medicine and Surgery	1919-20	1924

The hospital intern year has been adopted as an essential qualification for the license to practice in ten states, becoming effective in different years, as follows:

State Board of	Affects Student Matriculants	Affects All Applicants
Pennsylvania	1909-10	1914
New Jersey	1911-12	1916
Alaska	1912-13	1917
Rhode Island	1913-14	1917
North Dakota	1913-14	1918
Washington	1914-15	1919
Illinois	1917-18	1922
Michigan	1917-18	1922
Iowa	1918-19	1923
Texas	1919-20	1924

DESCRIPTION OF MEDICAL COLLEGES

Below are given brief descriptions of the medical colleges in the United States and Canada that are legally chartered to teach medicine, several of which do not grant degrees. The name, address, year of organization, history and date when first class graduated are given in each instance. Unless otherwise stated, a class graduated each subsequent year. Where official reports have been received from the college, information regarding faculty, entrance requirements, length of term, fees, students (excluding specials and postgraduates), graduates, name of dean and next session is given without discrimination, regardless as to whether the college is sectarian or not. In a few instances in which such reports were not received, the information published is from other reliable sources. Figures for graduates include all who graduated since July 1, 1920. Extract of rules and the membership of the Association of American Medical Colleges are shown following the list of colleges. Figures showing population of cities and states are taken from the United States Census Bureau's report for 1920. Statements have been added showing the preliminary requirements held by state licensing boards where those requirements include one or two years of collegiate work. Ten states, Alaska (Ter.), Illinois, Iowa, Michigan, New Jersey, North Dakota, Pennsylvania, Rhode Island, Texas and Washington, require also a year's hospital internship as an essential qualification for a license.

ALABAMA

Alabama, population 2,347,295, has one medical college, the School of Medicine of the University of Alabama, located in Tuscaloosa, a city with a population of 11,996.

In order to secure licenses to practice medicine in Alabama, students must complete two years of work in an approved college of liberal arts, including courses in physics, chemistry, biology and a modern language, prior to entering on the study of medicine.

Tuscaloosa

UNIVERSITY OF ALABAMA SCHOOL OF MEDICINE, University Campus, Tuscaloosa.—Organized in 1859 at Mobile as the Medical College of Alabama. Classes graduated in 1861 and subsequent years excepting 1862 to 1868, inclusive. Reorganized in 1897 as the medical department of the University of Alabama. Present title assumed in 1907, when all property was transferred to the University of Alabama. In 1920 clinical teaching was suspended and the medical school was removed to the university campus at Tuscaloosa. The course of study covers two years of thirty-two weeks each. The Dean is Dr. Clyde Brooks. Total registration for 1920-1921 was 26. The fifty-sixth session begins Sept. 7, 1921, and ends May 20, 1922.

ARKANSAS

Arkansas, population 1,750,995, has one medical college, the Medical Department of the University of Arkansas, located in Little Rock, a city of 65,030. It gives the courses of only the first two years of the medical course.

To secure licenses to practice medicine in Arkansas, students must complete two years of collegiate work, including college courses in physics, chemistry, biology and a modern language before beginning the study of medicine.

Little Rock

UNIVERSITY OF ARKANSAS MEDICAL DEPARTMENT, Markham and Center Streets.—Organized in 1879 as the Medical Department of Arkansas Industrial University. It assumed the present title in 1899. In 1911 the College of Physicians and Surgeons united with it and the new school was made an integral part of the University of Arkansas. The first class was graduated in 1880. Clinical teaching was suspended in 1919. The faculty consists of 13 professors and 7 lecturers and assistants, total 20. Entrance requirements are two years of collegiate work in addition to a four-year high school course. The course of study covers two years of thrty-two weeks each. The fees are $50 each year. The Dean is Dr. Morgan Smith. Total registration 1920-1921 was 22. The forty-third session begins Sept. 19, 1921, and ends June 7, 1922.

CALIFORNIA

California, population 3,426,536, has three medical colleges. Two are located in San Francisco, a city of 506,775 inhabitants. They are Leland Stanford Junior University School of Medicine and the College of Medicine of the University of California. The College of Medical Evangelists is located at Loma Linda and Los Angeles, the latter city having a population of 576,673.

To secure licenses to practice medicine in California under the "physician's and surgeon's" certificate, students must complete at least one year of recognized collegiate work including college courses in physics, chemistry, biology and a modern language before beginning the study of medicine.

Berkeley-San Francisco

UNIVERSITY OF CALIFORNIA MEDICAL SCHOOL, University Campus, Berkeley; Second and Parnassus Avenues, San Francisco.—Organized in 1863 as the Toland Medical College. The first class graduated in 1864. In 1872 it became the Medical Department of the University of California. In 1909 the College of Medicine of the University of Southern California, at Los Angeles, by legislative enactment, became a clinical department. This Los Angeles portion was changed to a graduate school in 1914. In 1915 the Hahnemann Medical College of the Pacific was merged, and elective chairs in homeopathic materia medica and therapeutics were provided. Three years of collegiate work are required for admission. The work of the first year and a half is given at Berkeley and the work of the last two and a half years at San Francisco. The faculty is composed of 49 professors and 159 associates and assistants, a total of 208. The course covers five years of nine months each, the fifth year to consist of an internship or of special work in a department of the medical school. Fees for the four years, respectively, for residents of California are $290, $235, $210 and $200; nonresidents are charged $175 additional each year. Total registration for 1920-1921 was 213; graduates, 30. The forty-ninth session begins Aug. 15, 1921, and ends May 10, 1922.

Loma Linda-Los Angeles

COLLEGE OF MEDICAL EVANGELISTS.—Organized in 1909. The faculty numbers 109. The first class graduated in 1914. The laboratory departments are at Loma Linda; the clinical departments at Los Angeles. The faculty is composed of 55 professors and 54 associates and assistants, a total of 109. The course extends over four years of nine months each. Two years of college work are required for admission. The total fees for the four years, respectively, are $236, $231, $211 and $211. The Dean is Dr. P. T. Magan, Los Angeles. The total registration for 1920-1921 was 169; graduates, 20. This college taught also 28 students of the College of Physicians and Surgeons of Los Angeles, 14 of whom obtained degrees from the latter college, and 6 students of the College of Physicians and Surgeons of San Francisco, 5 of whom were granted degrees from the last named institution. The thirteenth session begins Aug. 28, 1921, and ends May 9, 1922.

San Francisco-Palo Alto

LELAND STANFORD JUNIOR UNIVERSITY SCHOOL OF MEDICINE, University Campus, Palo Alto, and Sacramento and Webster Streets, San Francisco.—Organized in 1908 when, by an agreement, the interests of Cooper Medical College were taken over. The first class was graduated in 1913. The faculty consists of 53 professors and 61 lecturers, assstants, etc., a total of 114. Three years of collegiate work are required for admission. The school has the quarter system and the completion of any three quarters constitutes a college year. The course covers five years of nine months each, including a year of practical or intern work. The total fees for each of the first four year is $261. The Dean is Dr. W. Ophüls, San Francisco. The total registration for 1920-1921 was 161; graduates, 17. The twelfth session begins Oct. 1, 1921, and ends June 17, 1922.

COLORADO

Colorado, with a population of 939,376, has one medical college, the University of Colorado School of Medicine. The first two years of the course are given at Boulder, the seat of the university, while the last two, or clinical years, are given in Denver, which has a population of 256,491.

The Colorado State Board of Medical Examiners will register without further examination graduates of medical colleges in good standing who present licenses issued after examination by any other licensing board. The law permits any one, graduate or nongraduate, to try the board's written examination. No graduate of 1914 or thereafter is eligible to obtain a license in Colorado, or indorsement of his credentials, unless he graduated from a medical college which, at the time he matriculated, required at least two years' study, without conditions, in an accredited college of liberal arts, and this work must have included courses in physics, chemistry, biology and one modern language.

Boulder-Denver

UNIVERSITY OF COLORADO SCHOOL OF MEDICINE.—Organized in 1883. Classes were graduated in 1885 and in all subsequent years except 1898 and 1899. Denver and Gross College of Medicine was merged Jan. 1, 1911. The faculty embraces 37 professors and 27 lecturers, instructors and assistants, a total of 64. The work embraces a graded course of four years of nine months each. The entrance requirements are two years of college work counting toward a degree in arts in an accredited college or university. The fees for residents of Colorado, for each of the four years, are, respectively, $106, $106, $98 and $93, and $30 more each year for nonresidents. The Dean is Dr. Charles N. Meader. The total registration for 1920-1921 was 83, graduates, 15. The fortieth session begins Sept. 26, 1921, and ends June 12, 1922.

CONNECTICUT

Connecticut, with a population of 1,380,585, has one medical college, Yale University School of Medicine, located in New Haven, population 162,519.

Students who desire to practice medicine in Connecticut will not be eligible unless, prior to entering the study of medicine, they complete, in addition to an accredited four-year high school education, at least nine months of collegiate work including college courses in physics, chemistry and general biology.

New Haven

YALE UNIVERSITY SCHOOL OF MEDICINE, 150 York Street and Congress Avenue and Cedar Street.—Chartered in 1810 as the Medical Institution of Yale College. Organized in 1812; instruction began in 1813; first class graduated in 1814. A new charter in 1879 changed the name to the Medical Department of Yale College. In 1884, the Connecticut Medical Society surrendered such authority as had been granted by the first charter. In 1887, Yale College became Yale University. The faculty consists of 23 professors and 84 lecturers and assistants, a total of 107. The requirements for admission are two years of collegiate work plus evidence of satisfactory completion of courses in general physics, general inorganic chemistry, general biology, organic chemistry and physical chemistry or laboratory physics, all reasonably equivalent to the courses in these subjects in Yale University. The student also must have two years of French or German. The course covers four years of nine months each. The fees for the four years, respectively, are $305, $300, $300 and $310. The Dean is Dr. Milton C. Winternitz. The total registration for 1920-1921 was 119, graduates, 16. The one hundred and ninth session begins Sept. 29, 1921, and ends June 21, 1922.

DISTRICT OF COLUMBIA

The District of Columbia, population 437,571, has three medical colleges; George Washington University Medical School, Georgetown University School of Medicine and Howard University School of Medicine.

Washington

GEORGE WASHINGTON UNIVERSITY MEDICAL SCHOOL, 1335 H Street, N.-W.—Organized in 1825 as the Medical Department of Columbian College. Also authorized to use the name National Medical College. Classes were graduated in 1826 and in all subsequent years, except 1834 to 1838, and 1861 to 1863, inclusive. The original title was changed to Medical Department of Columbian University in 1873. In 1903 it absorbed the National University Medical Department. In 1904, by an act of Congress, the title of George Washington University was granted to the institution. The faculty is composed of 48 professors and 46 instructors, demonstrators and assistants, a total of 94. Two years of collegiate work are required for admission. The course covers four years of thirty-two weeks each. The total fees are $200 each year. The Dean is Dr. William C. Borden. The total registration for 1920-1921 was 114, graduates, 28. The one hundredth session begins Sept. 28, 1921, and ends June 7, 1922.

GEORGETOWN UNIVERSITY SCHOOL OF MEDICINE, 920 H Street, N.-W.—Organized in 1851. The first class graduated in 1852. The faculty contains 54 professors, 45 instructors and assistants; total, 99. Two years of collegiate work are required for entrance. The course of study covers four terms of eight and one half months each. The fees for each of the four sessions, respectively, are $215, $200, $200 and $210. The Dean is Dr. George M. Kober. The registration for 1920-1921 was 172; graduates, 21. The seventy-first session begins Sept. 25, 1921, and ends June 14, 1922.

HOWARD UNIVERSITY SCHOOL OF MEDICINE, Fifth and W Streets, N.-W.—Chartered in 1867. Organized in 1869. The first class graduated in 1871. Colored students compose a majority of those in attendance. The faculty comprises 15 professors and 24 lecturers and assistants, 39 in all. The admission requirements are two years of collegiate work, including physics, chemistry, botany and zoology, English and two years of French or German. The course covers four years of thirty-two weeks each. The fees of each of the four sessions, respectively, are $165, $155, $155 and $162. The Dean is Dr. Edward A. Balloch. Registration for 1920-1921 was 131; graduates, 30. The fifty-fourth session begins Oct. 1, 1921, and ends June 9, 1922.

GEORGIA

Georgia, population 2,894,683 has two medical colleges, University of Georgia Medical Department, located in Augusta, population 52,548, and the Emory University School of Medicine in Atlanta, a city of 200,616.

In order to secure a license to practice medicine in Georgia, students must complete two years of work in an approved college of liberal arts and sciences, including courses in physics, chemistry and biology, prior to entering on the study of medicine.

Atlanta

EMORY UNIVERSITY SCHOOL OF MEDICINE, 94 N. Butler Street.—Organized in 1854. Classes graduated 1855 to 1861, when it suspended. Reorganized in 1865. A class graduated in 1865 and each subsequent year except 1874. In 1898 it merged with the Southern Medical College (organized in 1878), taking the name of Atlanta College of Physicians and Surgeons. In 1913 it merged with the Atlanta School of Medicine (organized in 1905), reassuming the name of Atlanta Medical College. Became the Medical Department of Emory University in 1915; assumed present title in 1917. Two years of collegiate work are required for admission. The faculty has 64 professors and 48 associates and assistants, a total of 112. The course of study is four years of thirty-two weeks each. The fees for each of the four years, respectively, are $212, $195, $190 and $215. The Dean is Dr. W. S. Elkin. Total registration for 1920-1921 was 211; graduates, 39. The next session begins Sept. 28, 1921, and ends June 6, 1922.

Augusta

UNIVERSITY OF GEORGIA MEDICAL DEPARTMENT, University Place.—Organized in 1828 as the Medical Academy of Georgia, the name being changed to the Medical College of Georgia in 1829. Since 1873 it has been known as the Medical Department of the University of Georgia. Entire property transferred to the university in 1911. Classes were graduated in 1833 and in all subsequent years except 1862 and 1863. The faculty includes 16 professors and 29 assistants, 45 in all. Two years of collegiate work are required for entrance. The course is four years of thirty-four weeks each. Fees are $5 for matriculation and $60 each year for residents of Georgia and $150 each year for nonresidents. The Dean is Dr. W. H. Doughty, Jr. The total registration for 1920-1921 was 83; graduates, 20. The ninetieth session begins Sept. 14, 1921, and ends May 29, 1922.

ILLINOIS

Illinois, population 6,485,098, his six medical colleges, one of which gives instruction at night, all located in Chicago, a city of 2,701,705 inhabitants, and are as follows: Rush Medical College, Northwestern University Medical School, University of Illinois College of Medicine, Loyola University School of Medicine, Hahnemann Medical College and Hospital and the Chicago Medical School.

To be eligible for license to practice medicine in Illinois, students must complete two years of collegiate work including courses in physics, chemistry, biology and a modern language before entering on the study of medicine. Graduates of 1923 and thereafter must complete also a year's internship in a hospital.

Chicago

RUSH MEDICAL COLLEGE.—Founded in 1837; organized in 1843; was the medical department of Lake Forest University from 1887 until 1898, when it became affiliated with the University of Chicago. The first class graduated in 1844. The faculty is composed of 118 professors, 186 associates, instructors, etc., a total of 304. The requirements for admission are two years of college work, including courses in college chemistry, physics and biology, and a reading knowledge of German or French. Classes are limited to 100 students in each of the freshman and sophomore classes, and to 120 students in each of the clinical years. No application for admission is accepted after September 1. The school operates under the "quarter system" in which the year is divided into four quarters of twelve weeks each; the completion of the work of three of these quarters gives credit for a college year. The course covers four years of eight and a half months each, and a fifth year, consisting of a hospital internship or of a fellowship in one of the departments. All freshman and sophomore studies are given at the University of Chicago. The clinical years are given in the building at the corner of Wood and Harrison streets. The tuition fees for each of the four years, respectively, are $230, $225, $235 and $235. The Deans are Dr. Frank Billings and Dr. John M. Dodson. Total registration for 1920-1921 was 703; graduates, 132. The seventy-eighth session begins Oct. 1, 1921, and ends June 14, 1922.

NORTHWESTERN UNIVERSITY MEDICAL SCHOOL, 2421 South Dearborn Street.—Organized in 1859 as the Medical Department of Lind University. First class graduated in 1860. In 1864 it became independent as the Chicago Medical College. It united with Northwestern University in 1869, but retained the name of Chicago Medical College until 1891, when the present name was taken. Became an integral part of Northwestern University in 1905. The faculty comprises 67 professors and 105 lecturers and assistants, a total of 172. The requirements for admission are such as will admit to the College of Liberal Arts of Northwestern University, plus two years of college work, including courses in physics, chemistry, biology and a modern language. The course covers four years of eight months each. The fees for the four years, respectively, are $225, $220, $216 and $210. The Dean is Dr. Arthur I. Kendall. The total registration for 1920-1921 was 434; graduates, 78. The sixty-second session begins Oct. 4, 1921, and ends June 10, 1922.

UNIVERSITY OF ILLINOIS COLLEGE OF MEDICINE, 508 S. Honore Street.—Organized in 1882 as the College of Physicians and Surgeons. The first class graduated in 1883. It became the Medical Department of the University of Illinois by affiliation in 1897 and an integral part in 1910. The relationship with the university was canceled in June, 1912, but restored in March, 1913, when the present title was assumed. Two years of collegiate work are required for admission. The curriculum covers four years of thirty-four weeks each, and a year's internship in an approved hospital. The faculty is composed of 62 professors, 94 assistants and instructors, a total of 156. The total fees for the four years, respectively, are $165, $160, $150 and $170. The Dean is Dr. Albert C. Eycleshymer. The total registration for 1920-1921 was 320; graduates, 3. The fortieth session begins Sept. 26, 1921, and ends June 14, 1922.

LOYOLA UNIVERSITY SCHOOL OF MEDICINE, 706 S. Lincoln St., Chicago.—Organized in 1868 as the Bennett College of Eclectic Medicine and Surgery. Eclecticism dropped and title of Bennett Medical College assumed in 1909. First class graduated in 1870, and a class graduated each subsequent year. Absorbed the Illinois Medical College in 1910 and the Reliance Medical College in 1911. In 1910 it became by affiliation the School of Medicine of Loyola University; the university assumed full control in 1915. Took over by purchase the Chicago College of Medicine and Surgery in 1917. Two years of college work are required for admission. The faculty is composed of 61 professors, 65 assistants and instructors, a total of 126. The total fees for the four years are, respectively, $165, $165, $165 and $185. The Dean is Dr. Louis D. Moorhead. The total enrolment for 1920-1921 was 244; graduates, 70. The next session begins Oct. 1, 1921, and ends June 15, 1922.

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL OF CHICAGO, 2811 Cottage Grove Avenue.—Organized in 1859. The first class was graduated in 1861. Absorbed the Chicago Homeopathic Medical College in 1904. The faculty includes 60 professors and 30 lecturers, assistants, etc., a total of 90. Two years of collegiate work are required for admission. The course extends over four years of thirty-four weeks each. The tuition fees for the four years, respectively, are $166, $161.50, 176.50 and $191.50. The Dean is Dr. John C. Blake. The total registration for 1921-1922 was 68; graduates, 11. The sixty-second session begins Sept. 20, 1921, and ends June 15, 1922.

CHICAGO MEDICAL SCHOOL, an afternoon and night school, located at 3832 Rhodes Avenue.—Organized in 1911 as the Chicago Hospital College of Medicine; chartered in 1912. In December, 1917, the classes of the Jenner Medical College were transferred to it. Total registration for 1919-1920 was 88; graduates, 25. *Official reports state that the diplomas from this college are not recognized by the licensing boards of forty-two states.*

INDIANA

Indiana, population 2,930,544, has one medical college, the Indiana University School of Medicine, located at Indianapolis, a city of 314,194 people, except that the work of the first year is offered also at Bloomington, the seat of the University.

Students who intend to practice medicine in Indiana must complete two years of collegiate work, in addition to an accredited four-year high school course, prior to beginning the study of medicine.

Bloomington and Indianapolis

INDIANA UNIVERSITY SCHOOL OF MEDICINE.—Organized in 1903, but did not give all of the work of the first two years of the medical course until 1905. In 1907, by union with the State College of Physicians and Surgeons, the complete course in medicine was offered. In 1908 the Indiana Medical College, which was formed in 1905 by the merger of the Medical College of Indiana (organized in 1878), the Central College of Physicians and Surgeons (organized in 1879), and the Fort Wayne College of Medicine (organized in 1879), merged into it. The first class was graduated in 1908. The faculty consists of 63 professors and 87 lecturers, associates and assistants, a total of 150. Two years of collegiate work are required for admission. The work of the first year is emphasized only at Bloomington. The work of the other three years is all at Indianapolis. The fees for the four years, respectively, are $125, $125, $150 and $150. Matriculation fee, $5; microscope fee, $5 to $7.50 per semester. A fifth optional intern year leading to the "M.D. cum laude" has been added. The Assistant Dean at Bloomington is Dr. B. D. Myers; the Dean is Dr. Charles P. Emerson, Indianapolis. The total registration for 1920-1921 was 251; graduates, 60. The next session begins Sept. 12, 1921, and ends June 7, 1922.

IOWA

Iowa, population 2,403,630, has one medical college, the College of Medicine of the State University of Iowa, located in Iowa City, population 11,267.

Students who desire to practice medicine in Iowa must complete two years of work in an approved college of liberal arts prior to beginning the study of medicine, this preliminary college work to have included courses in physics, chemistry, biology and a foreign language.

Iowa City

STATE UNIVERSITY OF IOWA COLLEGE OF MEDICINE, University Campus.—Organized in 1869. First session began in 1870. First class graduated in 1871. Absorbed Drake University College of Medicine in 1913. The faculty is made up of 35 professors, 27 lecturers, demonstrators and assistants, a total of 62. Two years of collegiate work, including courses in physics, chemistry, biology, French or German and English, are required for admission. The course of study covers four years of thirty-six weeks each. The tuition fee for residents of Iowa is $150 per year and for nonresidents $175, plus a matriculation fee of $10 and a graduation fee of $10. The Dean is Dr. Lee Wallace Dean, Iowa City. Total registration for 1920-1921 was 268; graduates, 46. The fifty-second session begins Sept. 26, 1921, and ends June 6, 1922.

KANSAS

Kansas, population 1,769,257, has one medical college. The School of Medicine of the University of Kansas gives its first two years in Lawrence, population 12,456, and the last two years in Rosedale, a suburb of Kansas City, which with Kansas City, Mo., have a combined population of 433,261.

Students who desire to practice medicine in Kansas must complete at least two years of collegiate work including college courses in physics, chemistry and biology in addition to an accredited four-year high school course.

Lawrence and Rosedale

UNIVERSITY OF KANSAS SCHOOL OF MEDICINE.—Organized in 1880. It offered only the first two years of the medical course until in 1905, when it merged with the Kansas City (Mo.) Medical College, founded in 1869, the College of Physicians and Surgeons, founded in 1894, and the Medico-Chirurgical College, founded in 1897. First class graduated in 1906. The clinical courses are given at Rosedale. Absorbed Kansas Medical College in 1913. The faculty, including lecturers and clinical assistants, numbers 62. The requirements for admission are two years of collegiate work. The course covers four years of nine months each. The total fees for residents of the state for each of the four years are, respectively, $131, $131, $133 and 133. For nonresidents the fees of the first two years are $141 each year. The Associate Dean is Dr. M. D. Sudler. The total registration for 1920-1921 was 134; graduates, 29. The forty-second session begins Sept. 12, 1921, and ends June 7, 1922.

KENTUCKY

Kentucky, population 2,416,013 has one medical college, the University of Louisville Medical Department, situated in Louisville, a city of 234,891 inhabitants.

To be eligible for license to practice medicine in Kentucky, students must complete two years of college work, including courses in physics, chemistry, biology and a modern language prior to beginning the study of medicine.

Louisville

UNIVERSITY OF LOUISVILLE MEDICAL DEPARTMENT, First and Chestnut Streets.—Organized in 1837 as the Louisville Medical Institute. The first class graduated in 1838, and a class graduated in each subsequent year except in 1863. In 1846 the present name was assumed. In 1907 it absorbed the Kentucky University Medical Department. In 1908 it absorbed the Louisville Medical College, the Hospital College of Medicine and the Kentucky School of Medicine. Two years of collegiate work are required for admission. It has a faculty of 32 professors and 85 lecturers and assistants, a total of 117. The course covers four years of thirty-two weeks each. The fees for the four years, respectively, are $215, $170, $175 and $180. The Dean is Dr. Henry Enos Tuley. The total registration for 1920-1921 was 179; graduates, 49. The next session begins Sept. 20, 1921, and ends June 8, 1922.

LOUISIANA

Louisiana, having a population of 1,797,798, contains one medical college, the School of Medicine of the Tulane University of Louisiana, situated in New Orleans, a city of 387,408.

Students who desire to practice medicine in Louisiana must complete, at an approved college or university, two years of college work, including biology, physics, chemistry and a modern language, before entering on the study of medicine.

New Orleans

TULANE UNIVERSITY OF LOUISIANA SCHOOL OF MEDICINE, University Campus and 1551 Canal Street.—Organized in 1834 as the Medical College of Louisiana. Classes were graduated in 1835 and in all subsequent years except 1863-1865, inclusive. It was transferred to the Medical Department of the University of Louisiana in 1847 and became the Medical Department of the Tulane University of Louisiana in 1884. Present name in 1913, when it became the School of Medicine of the College of Medicine of the Tulane University of Louisiana. The faculty has 35 professors and 128 assistant professors, instructors, demonstrators, etc., a total of 163. The course covers four years of thirty-two weeks each. Two years of collegiate work are required for admission. Total fees for each of the four years, respectively, are $220, $225, $215 and $245. The President is Dr. A. B. Dinwiddie. The total registration for 1920-1921 was 380; graduates, 118. The eighty-seventh session begins Sept. 26, 1921, and ends June 7, 1922.

MARYLAND

Maryland, with a population of 1,449,610, contains two medical colleges, located in Baltimore, a city with 733,826 inhabitants. They are as follows: Johns Hopkins University Medical Department, and the University of Maryland School of Medicine and College of Physicians and Surgeons, the last two having been merged.

To be eligible to practice medicine in Maryland, students, in addition to a four-year high school education, must complete at least two years of college work including courses in physics, chemistry, biology and French or German, prior to beginning the study of medicine.

Baltimore

JOHNS HOPKINS UNIVERSITY MEDICAL DEPARTMENT, Washington and Monument Streets.—Organized in 1893. The first class graduated in 1897. The faculty consists of 52 professors and 133 clinical professors, etc., a total of 185. The requirements for admission demand that the applicant either has (*a*) completed the chemical-biologic course which leads to the A.B. degree in the university, or (*b*) graduated at an approved college or scientific school and has a knowledge of French and German, physics, chemistry and biology, such as may be obtained from a year's course. The course extends over four years of eight and one-half months each. The total fees are $267 each year. The Dean is Dr. J. Whitridge Williams. Total registration for 1920-1921 was 363; graduates, 92. The twenty-ninth session begins Oct. 1, 1921, and ends June 13, 1922.

UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE AND THE COLLEGE OF PHYSICIANS AND SURGEONS, Lombard and Green Streets.—Organized in 1807 as the College of Medicine of Maryland. The first class graduated in 1810. In 1812 it became the University of Maryland School of Medicine. Baltimore Medical College was merged into it in 1913. In 1915 the College of Physicians and Surgeons was merged and the present name assumed. The faculty consists of 91 professors and 70 instructors and assistants, a total of 161. Two years of collegiate work are required for admission. The course covers four years of eight months each. The total fees are $215 each year. The Dean is Dr. J. M. H. Rowland. Total registration for 1920-1921 was 251; graduates, 71. The fifteenth session begins Oct. 1, 1921, and ends June 1, 1922.

MASSACHUSETTS

Massachusetts, population 3,852,356, has five medical colleges: Medical School of Harvard University, Boston University School of Medicine, Tufts College Medical School, College of Physicians and Surgeons and the Middlesex College of Medicine and Surgery. They are all situated in Boston, a city of 748,060, except the last named, which is in Cambridge, a city of 109,694.

Boston

MEDICAL SCHOOL OF HARVARD UNIVERSITY, 240 Longwood Avenue.—Organized in 1782. The first class graduated in 1788. It has a faculty of 68 professors and 154 instructors and assistants, a total of 222. Candidates for admission must present a college degree or two years of work leading to such a degree with standing in the upper third of the class. The college work must include a year of physics, biology, general chemistry, a half year of organic chemistry, and a reading knowledge of French or German. The total fees for each of the four years are $330, $300, $300 and $300. The Dean is Dr. David L. Edsall. The total registration for 1920-1921 was 442; graduates, 105. The one hundred and fortieth session begins Sept. 26, 1921, and ends June 22, 1922.

BOSTON UNIVERSITY SCHOOL OF MEDICINE, 80 East Concord Street.—Organized in 1873. In 1874 the New England Female Medical College, founded in 1848, was merged into it. The first class graduated in 1874. Became nonsectarian in 1918. Two years of collegiate work are required for admission. The faculty includes 24 professors, 57 associates, etc., making a total of 81. The course covers four years of thirty-two weeks each. Total fees for each of the four years, respectively, are $200, $200, $200 and $230. The Dean is Dr. John P. Sutherland. Total registration for 1920-1921 was 122; graduates, 13. The forty-ninth session begins Oct. 6, 1921, and ends June 19, 1922.

TUFTS COLLEGE MEDICAL SCHOOL, 416 Huntington Avenue.—Organized in 1893 as the Medical Department of Tufts College. The first class graduated in 1894. It has a faculty of 47 professors and 88 assistants, lecturers, etc., a total of 135. Two years of collegiate work are required for admission. The course covers four years of eight months each. The total fees for each of the four years are $236, $221, $211 and $216. The Dean is Dr. Charles F. Painter. Total registration for 1920-1921 was 398; graduates, 80. The twenty-sixth session begins Sept. 19, 1921, and ends June 14, 1922.

COLLEGE OF PHYSICIANS AND SURGEONS, 517 Shawmut Avenue.—Organized in 1880. The first class graduated in 1882. Total attendance of medical students during 1920-1921 was about 32. There were 7 graduates. *This college has been reported not recognized by the Massachusetts Medical Society and by the licensing boards of forty-two states.*

Cambridge

MIDDLESEX COLLEGE OF MEDICINE AND SURGERY, Cambridge.—Organized in 1914 under the charter of the Worcester Medical College, which became extinct in 1859. A class was graduated in 1915 and each subsequent year. Was closely related in its interests with an osteopathic college and granted a liberal advanced standing for work done in that and other osteopathic colleges. During 1920-1921 it had a total enrolment of 121; graduates, 39. *This college has been reported as not recognized by the licensing boards of forty-three states.*

MICHIGAN

Michigan, population 3,133,678, has three medical colleges. Two of these, the University of Michigan Department of Medicine and Surgery and the Homeopathic Medical College of the University of Michigan, are located at Ann Arbor, a city of 19,516 people. The Detroit College of Medicine and Surgery is located at Detroit, a city of 993,739 inhabitants.

Students who desire to practice medicine in Michigan, in addition to an accredited four-year high school education, must complete two years of work in an approved college of liberal arts, including college courses in physics, chemistry, biology and French or German, prior to beginning the study of medicine.

Ann Arbor

UNIVERSITY OF MICHIGAN MEDICAL SCHOOL.—Organized in 1850 as the University of Michigan Department of Medicine and Surgery. The first class graduated in 1851. Present title assumed in 1915. It has a faculty composed of 38 professors and 62 associates, instructors, etc., a total of 100. The entrance requirements are two years of college work, including courses in chemistry, physics and biology, with laboratory work, and a reading knowledge of one modern language. The curriculum embraces four years of nine months each. The total fees for Michigan students are $140 each year and $200 for nonresidents. The matriculation fee for residents is $10; for nonresidents, $25. The Assistant Dean is Dr. C. W. Edmunds. The total registration for 1920-1921 was 449; graduates, 71. The seventy-second session begins Sept. 22, 1921, and ends June 19, 1922.

UNIVERSITY OF MICHIGAN HOMEOPATHIC MEDICAL SCHOOL.—Organized in 1875. The first class graduated in 1877. The work of the first two years is taken under the same teachers and in the same classes with the Medical School of the University of Michigan, and the fees charged are the same. The faculty for the last two years composes 6 professors and 11 associates, instructors, etc. The entrance requirements are two years of collegiate work. The Dean is Dr. W. B. Hinsdale. The total registration for 1920-1921 was 50; graduates, 5. The next session begins Sept. 27, 1921, and ends June 19, 1922.

Detroit

DETROIT COLLEGE OF MEDICINE AND SURGERY, 250 St. Antoine Street.—Organized as the Detroit College of Medicine in 1885 by consolidation of Detroit Medical College, organized in 1868, and the Michigan College of Medicine, organized in 1880. Reorganized with present title in 1913. The first class graduated in 1886. In 1918 it became a municipal institution under the control of the Detroit Board of Education. Entrance requirements are two years of collegiate work. The faculty embraces 32 professors, 174 lecturers, etc., a total of 206. The course covers five years of eight months each (including the hospital intern year). The total fees each year are $150—if residents of Detroit the fees are $25. The Dean is Dr. W. H. MacCraken. The total registration for 1920-1921 was 158; graduates, 53. The thirty-seventh session begins Sept. 26, 1921, and ends June 17, 1922.

MINNESOTA

Minnesota, population 2,386,371, contains one medical school, the University of Minnesota Medical School, situated in Minneapolis, a city of 380,582 inhabitants.

Students intending to practice medicine in Minnesota, in addition to an accredited four-year high school education, must complete two years of college work the equivalent of that done in the liberal arts department of the University of Minnesota, including courses in physics, chemistry and biology, prior to beginning the study of medicine.

Minneapolis

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL.—Organized in 1883 as the University of Minnesota College of Medicine and Surgery, reorganized in 1888 by absorption of St. Paul Medical College and Minnesota Hospital College. The first class graduated in 1889. In 1908 the Minneapolis College of Physicians and Surgeons, organized in 1883, was merged. In 1909 the Homeopathic College of Medicine and Surgery was merged. Present title in 1913. The faculty includes 91 professors and 114 instructors and assistants, a total of 205. The curriculum covers four years of nine months each, and a year's internship in an approved hospital. The school is operated on the four-quarter plan. The entrance requirements are two years of university work, which must include six semester credits of rhetoric, eight semester credits of physics; twelve credits of general chemistry, qualitative analysis and organic chemistry; eight credits of zoology, and a reading knowledge of French or German. Students are required to secure a degree of B.S. or A.B. before receiving the degree of Bachelor of Medicine (M.B.) which is granted at the end of the four-year course. The M.D. is conferred after a year of intern work or of advanced laboratory work has been completed. Total fees are $198 for residents and $228 for nonresidents, each year of three quarters. The Dean is Dr. E. P. Lyon. The total registration for 1920-1921 was 384; graduates, 53. The thirty-third session begins Sept. 28, 1921, and ends June 14, 1922. The summer quarter begins June 21.

MISSISSIPPI

Mississippi, population 1,789,384, has one medical college, the Department of Medicine of the University of Mississippi, which is located at Oxford, a city of 1,948 inhabitants.

Students desiring to practice medicine in Mississippi, in addition to a standard four-year high school education, must complete two years of work in an approved college or university, including courses in physics, chemistry, biology and a modern language, before entering on the study of medicine.

Oxford

UNIVERSITY OF MISSISSIPPI SCHOOL OF MEDICINE.—Organized in 1903. Gives only the first two years of the medical course. In 1908 a clinical department was established at Vicksburg, but was discontinued in 1910 after graduating one class. The session extends over eight and a half months. Entrance requirements are two years of collegiate work. The total fees each year are $133. The faculty numbers 17. The Dean is Dr. W. S. Leathers. The total registration for 1920-1921 was 49. The nineteenth session begins Sept. 14, 1921, and ends May 29, 1922.

MISSOURI

Missouri, population 3,403,547, has six medical colleges. St. Louis, population 773,000, contains three of these, viz., the School of Medicine of St. Louis University, Washington University Medical School, and the St. Louis College of Physicians and Surgeons. Kansas City, which, with Kansas City, Kansas, has a population of 433,261, has two colleges, the Kansas City College of Medicine and Surgery and the Kansas City University of Physicians and Surgeons, neither of which is approved as reputable by the Missouri State Board of Health. The School of Medicine of the University of Missouri is at Columbia, a town of 10,681 people.

Columbia

UNIVERSITY OF MISSOURI SCHOOL OF MEDICINE.—Organized at St. Louis in 1845; was discontinued in 1855, but was reorganized at Columbia in 1872. Teaching of the clinical years was suspended in 1909. The faculty includes 14 professors and 14 assistant professors, lecturers, etc., a total of 28. The course covers two years of thirty-two weeks each. The entrance requirements are two years of college work including French or German, 8 hours; general zoology, 8 hours; physics, 8 hours; inorganic chemistry, 8 hours; organic chemistry, 5 hours, and general bacteriology, 3 hours. Total fees are $100 for each year. Nonresidents of the state pay $10 per term extra. The Dean is Dr. Guy L. Noyes. Total registration for 1920-1921 was 81. The next session begins Aug. 29, 1921, and ends April 26, 1922.

Kansas City

KANSAS CITY COLLEGE OF MEDICINE AND SURGERY, Twenty-Third and Holmes Streets.—Organized in 1915 as an offshoot of the Eclectic Medical University, a Class C medical school, now extinct. It claims to be an eclectic college, but is reported not recognized as such by the National Eclectic Medical Association. Total registration for 1920-1921 was about 90; graduates, 14. Since this school is an offshoot of a Class C medical college and is *reported not recognized by the Missouri State Board of Health and by the licensing boards of thirty-nine other states*, no higher rating can be granted to it, pending an inspection, which it has refused.

KANSAS CITY UNIVERSITY OF PHYSICIANS AND SURGEONS, 729 Troost Street.—Originally chartered in 1903 as the Central College of Osteopathy; charter amended in 1917, by which it obtained the right to grant degrees in medicine, and the name was changed to the Central College Medical Department. Present title in 1918. Very liberal advanced standing allowed for work done in osteopathic colleges, and it still has osteopathic classes. Total enrolment in 1920-1921 was 90; graduates, 25. Rated in Class C by the Council on Medical Education. *Reported not recognized by the licensing boards of Missouri and of forty-five other states.*

St. Louis

WASHINGTON UNIVERSITY SCHOOL OF MEDICINE, Kingshighway and Euclid Avenue.—Organized in 1842 as the Medical Department of St. Louis University. In 1835 it was chartered as an independent institution under the name of St. Louis Medical College. The first class graduated in 1843. In 1891 it became the Medical Department of Washington University. In 1899 it absorbed the Missouri Medical College. The faculty comprises 33 professors and 113 lecturers, instructors, etc., a total of 146. Two years of college work are required for admission, including courses in English, physics, chemistry and biology, and a reading knowledge of German. The course is four years of eight months each. The total fees for the four years are, respectively, $221, $216, $216 and $221. The Dean is Dr. Nathaniel Allison. The total registration for 1920-1921 was 188; graduates, 45. The next session begins Sept. 22, 1921, and ends June 18, 1922.

ST. LOUIS UNIVERSITY SCHOOL OF MEDICINE, 1402 South Grand Avenue.—Organized in 1901 as the Marion-Sims-Beaumont Medical College by union of Marion Sims Medical College, organized in 1890, and Beaumont Hospital Medical College, organized in 1886. First class graduated in 1902. It became the Medical Department of St. Louis University in 1903. The faculty is composed of 54 professors and 84 lecturers and assistants, a total of 138. Two years of collegiate work are required for admission. The curriculum covers four years of thirty-two weeks each. The summer season is optional. The total fees are $250 each year. The Dean is Dr. Hanau W. Loeb. The total registration for 1920-1921 was 284; graduates, 65. The next session begins Oct. 1, 1921, and ends June 1, 1922.

ST. LOUIS COLLEGE OF PHYSICIANS AND SURGEONS, Jefferson and Gamble Streets.—Organized in 1869. Classes graduated in 1870 and each subsequent year until 1873, when it suspended. Reorganized in 1879. Classes graduated in 1880 and subsequent years until 1915, when it merged with the Medical Department of the National University of Arts and Sciences. Reestablished in 1916. Registration during 1920-1921 was 120; graduates, 65. *This college is reported as not recognized by the licensing boards of Missouri and forty-three other states.*

NEBRASKA

Nebraska, population 1,295,502, has two medical colleges, the University of Nebraska College of Medicine and the Creighton University College of Medicine, both in Omaha, population 191,601.

Omaha

CREIGHTON UNIVERSITY COLLEGE OF MEDICINE, Fourteenth and Davenport Streets.—Organized in 1892 as the John A. Creighton Medical College. Present title in 1921. The first class graduated in 1893. It has a faculty of 40 professors and 16 associates, lecturers and assistants, a total of 56. Two years of collegiate work are required for admission. The course of study embraces four years of eight months each. Continuous session adopted for seniors only. The total fees each year for the four years are, respectively, $175, $165, $165 and $170. The Dean is Dr. Hermann von Schulte. Total registration for 1920-21 was 116, graduates 22. The fortieth session begins Sept. 21, 1921, and ends June 3, 1922.

UNIVERSITY OF NEBRASKA COLLEGE OF MEDICINE, Forty-Second Street and Dewey Avenue.—Organized in 1881 as the Omaha Medical College. The first class graduated in 1882. It became the Medical Department of Omaha University in 1891. In 1902 it affiliated with the University of Nebraska, with the present title. The first two years were given at Lincoln and the last two in Omaha until 1913, when all four years were transferred to Omaha. The faculty is composed of 21 professors and 67 lecturers and instructors, total 88. Two years of collegiate work are required for admission, including courses in physics, chemistry and zoology. The fees for each of the four years, respectively, are $140, $120, $110 and $110. The Dean is Dr. Irving S. Cutter. Total registration for 1920-1921 was 196, graduates 50. The next session begins Sept. 14, 1921, and ends June 4, 1922.

NEW HAMPSHIRE

New Hampshire, population 443,083, has one medical college, located at Hanover, population 1,551.

Students desiring to practice medicine in New Hampshire, in addition to a four-year high school education, must complete at least two years of work in an approved college of liberal arts, prior to beginning the study of medicine.

DARTMOUTH MEDICAL SCHOOL.—Organized as New Hampshire Medical Institute in 1797. The first class graduated in 1798. It is under the control of the trustees of Dartmouth College. Clinical teaching was discontinued in 1914. The faculty is made up of 10 professors and 2 instructors, a total of 12. Three years of collegiate work are required for admission. The course covers nine calendar months in each year, or eight months of actual teaching. Candidates for the A.B. or B.S. degree in Dartmouth College may substitute the work of the first year in medicine for that of the senior year in the academic department. The fees for each year are $250. Dean, Dr. John M. Gile; Secretary, Colin C. Stewart. The total registration for 1920-1921 was 18. The next session opens Sept. 22, 1921, and ends June 20, 1922.

NEW YORK

New York State, population 10,384,144, has eight medical colleges. Five of these, College of Physicians and Surgeons (Columbia University), Cornell University Medical College, the University and Bellevue Hospital Medical College, Long Island College Hospital and the New York Homeopathic Medical College and Flower Hospital are located in New York City, population 5,620,048. Albany Medical College is located in Albany, a city of 113,344 people. The University of Buffalo Medical Department is situated in Buffalo, population 506,775. The College of Medicine, Syracuse University, is in Syracuse, a city of 171,647 inhabitants.

Students who desire to practice in New York must complete two years of college work before entering on the study of medicine.

Albany

ALBANY MEDICAL COLLEGE, 58-64 Eagle Street.—Organized in 1838. The first class graduated in 1839. It became the Medical Department of Union University in 1873. In 1915 Union University assumed educational control. The faculty is composed of 25 professors and 39 instructors, assistants, etc., a total of 64. Two years of collegiate work, including college courses in physics, chemistry (including organic), biology, English, and a modern foreign language, are required for admission. The curriculum covers four years of eight months each. The total fees for the four years, respectively, are $245, $240, $210 and $205. The Dean is Dr. Thomas Ordway. The total registration for 1920-1921 was 92; graduates, 17. The ninety-first session begins Sept. 19, 1921, and ends June 12, 1922.

Buffalo

UNIVERSITY OF BUFFALO MEDICAL DEPARTMENT, High Street, near Main.—Organized in 1846. The first class graduated in 1847. It absorbed the Medical Department of Niagara University in 1898. The faculty is composed of 37 professors and 81 lecturers, assistants, etc., a total of 118. Two years of collegiate work, including college courses in physics, chemistry, biology, English and French or German are

required for admission. The course covers four years of eight months each. The total fees for each of the four years are $292, matriculation fee, $5. The Dean is Dr. C. Sumner Jones. Total registration for 1920-1921 was 219; graduates, 60. The seventy-sixth session begins Sept. 26, 1921, and ends June 9, 1922.

New York

COLUMBIA UNIVERSITY COLLEGE OF PHYSICIANS AND SURGEONS, 437 West Fifty-Ninth Street.—Organized in 1807 by the regents of the University of the State of New York as their medical department. The first class graduated in 1811. In 1860 it became, by affiliation, the Medical Department of Columbia College. It was made a permanent part of Columbia College by legislative enactment in 1891. That institution became Columbia University in 1896. The faculty is composed of 91 professors and 269 instructors, demonstrators, etc., a total of 360. Two years of collegiate work, including courses in physics, chemistry, biology, English and either French or German are required for admission. The work covers four years of eight months each. The Dean is Dr. William Darrach. The total fees for the four years, respectively, are $332, $332, $332 and $352. Total registration for 1920-1921 was 364; graduates, 117. The one hundred and fourteenth session begins Sept. 28, 1921, and ends June 7, 1922.

CORNELL UNIVERSITY MEDICAL COLLEGE, First Avenue and Twenty-Eighth Street, New York City, and Ithaca.—Organized in 1898. The first class was graduated in 1899. The work of the first year may be taken either in Ithaca or New York. The faculty is composed of 56 professors and 124 assistants, lecturers, instructors, etc., a total of 180. All candidates for admission must be graduates of approved colleges or scientific schools or seniors of approved colleges which will permit them to substitute the first year of this medical school for the fourth year of their college course and will confer on them the Bachelor degree on the completion of the year's work. The candidate must also have such knowledge of physics, inorganic chemistry and biology as may be obtained in college by a year's course in these subjects when accompanied by laboratory work. The fees for each of the four years are, respectively, $355, $345, $345 and $335. The Dean is Dr. Walter L. Niles. Total registration for 1920-1921 was 228; graduates, 46. The twenty-fourth session begins Sept. 26, 1921, and ends June 8, 1922.

LONG ISLAND COLLEGE HOSPITAL, 350 Henry Street, Brooklyn.—Organized in 1858. The first class graduated in 1860. It has a faculty of 44 professors and 88 assistants, instructors, etc., a total of 132. Two years of collegiate work, including college courses in physics, chemistry and biology, are required for admission. The course covers four years of eight months each. The fees for the four years, respectively, are $356, $350, $350 and $380. The Dean is Mr. Adam M. Miller. Total registration for 1920-1921 was 276; graduates, 81. The sixty-fourth session begins Sept. 26, 1921, and ends May 29, 1922.

NEW YORK HOMEOPATHIC MEDICAL COLLEGE AND FLOWER HOSPITAL, Eastern Boulevard, between Sixty-Third and Sixty-Fourth Streets.—Organized in 1858. Incorporated in 1860 as the Homeopathic Medical College of the State of New York. The title New York Homeopathic Medical College was assumed in 1869. Present title assumed in 1908. The first class graduated in 1861. The course covers four years of eight months each. It has a faculty of 24 professors and 37 lecturers, and assistants, a total of 61. The total fees each year are $270. Total registration for 1920-1921 was 130; graduates, 41. The sixty-second session begins Sept. 15, 1921, and ends June 10, 1922.

UNIVERSITY AND BELLEVUE HOSPITAL MEDICAL COLLEGE, 338 East Twenty-Sixth Street.—Organized in 1898 by the union of the New York University Medical College, organized in 1841, and the Bellevue Hospital Medical College, organized in 1861. It is the Medical Department of New York University. First class graduated in 1899. The faculty is composed of 65 professors and 106 instructors, etc., in all 171. The course covers four years of eight months each. Entrance requirements are two years of collegiate work, in addition to a standard four-year high school course, including college courses in physics, chemistry and biology. The fees for each of the four years are, respectively, $320, $320, $320 and $345. The Dean is Dr. Samual A. Brown. Total registration for 1920-1921 was 428; graduates, 114. The next session begins Sept. 14, 1921, and ends June 6, 1922.

Syracuse

SYRACUSE UNIVERSITY COLLEGE OF MEDICINE, 307-311 Orange Street.—Organized in 1872, when the Geneva Medical College, chartered in 1834, was removed to Syracuse, under the title "The College of Physicians and Surgeons of Syracuse University." Present title assumed in 1875, when a compulsory three-year graded course was established. The first class graduated in 1873 and a class graduated each subsequent year. In 1889 the amalgamation with the university was made complete. Course extended to four years in 1896. Two years of a recognized college course are required for admission. The course covers four years of thirty-five weeks each. The fees are $10 annually; graduation fee, $10. The faculty is composed of 35 professors and 78 associate and assistant professors, lecturers and instructors, a total of 113. The Dean is Dr. John L. Heffron. The total enrolment for 1920-1921 was 159; graduates, 33. The fifty-first session begins Sept. 13, 1921, and ends June 12, 1922.

NORTH CAROLINA

North Carolina, population 2,556,486, has two medical schools, each of which gives only the first two years of the medical course. The School of Medicine of the University of North Carolina is located at Chapel Hill, population 1,483. Wake Forest College School of Medicine is at Wake Forest, population 1,425.

Students intending to practice medicine in North Carolina must complete two years of college work including courses in physics, chemistry and biology in addition to 14 units of high school work before beginning the study of medicine.

Chapel Hill

UNIVERSITY OF NORTH CAROLINA SCHOOL OF MEDICINE.—Organized in 1890. Until 1902 this school gave only the work of the first two years, when the course was extended to four years by the establishment of a department at Raleigh. The first class graduated in 1903. A class was graduated each subsequent year, including 1910, when the clinical department at Raleigh was discontinued. Two years of collegiate work are required for admission. The faculty is composed of 14 professors and 11 lecturers, assistants, etc., a total of 25. The fees for each year are $195. The Dean is Dr. I. H. Manning. The total registration for 1920-1921 was 72. The thirty-sixth session begins Sept. 29, 1921, and ends June 4, 1922.

Wake Forest

WAKE FOREST COLLEGE SCHOOL OF MEDICINE.—This school was organized in 1902. The faculty, including the professors of chemistry, physics and biology, numbers 15. Only the first two years of the medical course are offered after the completion of freshman and sophomore college work, and on this combined course the B.S. degree is conferred. Each annual course extends over nine months. The fees for each year aggregate $200. The Secretary is Dr. Thurman D. Kitchen. The total registration for 1920-1921 was 49. The twentieth session begins Sept. 6, 1921, and ends May 26, 1922.

NORTH DAKOTA

North Dakota, population 645,730, has one medical college, the School of Medicine of the University of North Dakota, which is situated at University, a suburb of Grand Forks, a city of 14,010 people. It gives only the first two years of the medical course.

Students intending to practice medicine in North Dakota, in addition to a four-year high school education, must complete two years of work in an approved college of liberal arts including courses in Latin, physics, chemistry, botany and zoology, prior to beginning the study of medicine, and must show evidence of having spent at least one year as an intern in a hospital.

University

UNIVERSITY OF NORTH DAKOTA SCHOOL OF MEDICINE.—Organized in 1905. Offers only the first two years of the medical course. Two years' work in a college of liberal arts is required for admission. The fees are about $85 each year. The faculty consists of 8 professors and 7 instructors, a total of 15. The Dean is Dr. Harley E. French. The total registration for 1920-1921 was 39. The sixteenth session begins Sept. 23, 1921, and ends June 13, 1922.

OHIO

Ohio, population 5,759,368, has five medical colleges. Two of these, the Medical College of the University of Cincinnati and the Eclectic Medical College, are located in Cincinnati, a city of 401,247 inhabitants. Cleveland, population 796,836, contains one medical school, Western Reserve University School of Medicine. Columbus, population 237,031, contains the two departments of the Ohio State University, the College of Medicine and the College of Homeopathic Medicine.

Cincinnati

UNIVERSITY OF CINCINNATI COLLEGE OF MEDICINE, Eden Avenue, Cincinnati General Hospital.—Organized in 1909 by the union of the Medical College of Ohio (founded in 1819) with the Miami Medical College (founded in 1852). The Medical College of Ohio became the Medical Department of the University of Cincinnati in 1896. Under a similar agreement, March 2, 1909, the Miami Medical College also merged into the University, when the title of Ohio-Miami Medical College of the University of Cincinnati was taken. Present title assumed in 1915. Two years of college work are required for admission. The faculty consists of 76 professors, 101 associates, assistants, etc., a total of 177. The course covers four years of eight months each. The fees for each of the four years, respectively, are $300, $260, $210 and $215. The Dean is Dr. Henry Page. The total registration for 1920-1921 was 238; graduates, 59. The next session begins Oct. 3, 1921, and ends June 17, 1922.

ECLECTIC MEDICAL COLLEGE, 630 West Sixth Street.—Organized in 1833 at Worthington as the Worthington Medical College. Removed to Cincinnati in 1843. In 1845 it was chartered as the Eclectic Medical Institute. In 1857 the American Medical College, organized in 1839, was merged into it, and in 1859 the Eclectic College of Medicine and Surgery, organized in 1856, was merged into it. In 1910 it assumed its present title. Classes were graduated in 1833 and in all subsequent years except 1839 to 1843, inclusive. It has a faculty of 30 professors and 11 lecturers and assistants, a total of 41. Two years of college work are required for admission. The course covers four years of eight months each. The total fees for the four years, respectively, are $160, $150, $150 and $150. The Secretary is Dr. John K. Scudder. Total registration for 1920-1921 was 98; graduates, 30. The next session begins Sept. 15, 1921, and ends May 15, 1922.

Cleveland

WESTERN RESERVE UNIVERSITY SCHOOL OF MEDICINE, 1353 East Ninth Street.—Organized in 1843 as the Cleveland Medical College. The first class graduated in 1844. It assumed the present title in 1881. In 1910 the Cleveland College of Physicians and Surgeons was merged. The faculty includes 18 professors and 111 lecturers, assistants, etc., a total of 129. The curriculum embraces three years of eight and one-half months each and one year of eleven months. Three years of college work are required for admission. The total fees for each of the four years are, respectively, $285, $260, $254 and $255. The Dean is Dr. C. A. Hamann. The total registration for 1920-1921 was 152; graduates, 45. The seventy-ninth session begins Sept. 29, 1921, and ends June 15, 1922.

Columbus

OHIO STATE UNIVERSITY COLLEGE OF MEDICINE, 710 North Park Street.—Organized in 1907 as the Starling-Ohio Medical College by the union of Starling Medical College (organized 1847) with the Ohio Medical University (organized 1890). In 1914 it became an integral part of the Ohio State University with its present title. The faculty consists of 41 professors and 55 lecturers, demonstrators, etc., a total of 96. Two years of collegiate work are required for admission. The course covers four years of eight months each. Tuition fees are $152 each year for residents of Ohio; for nonresidents, the fees are $202. The Dean is Dr. Eugene F. McCampbell. The total registration for 1920-1921 was 180; graduates, 31. The next session begins Sept. 20, 1921, and ends June 13, 1922.

OHIO STATE UNIVERSITY COLLEGE OF HOMEOPATHIC MEDICINE.—Organized in 1914, when the property of the Cleveland-Pulte Medical College of Cleveland was transferred to the Ohio State University. The faculty numbers 21. Two years of college work are required for admission. The students are taught largely in the same classes and by the same teachers as students of the College of Medicine during the first two years and the tuition fees are the same. The Dean is Dr. Claude A. Burrett. The total registration for 1920-1921 was 40; graduates, 9. The seventh session begins Sept. 20, 1921, and ends June 13, 1922.

OKLAHOMA

Oklahoma, population 2,027,564, has one medical college, the School of Medicine of the University of Oklahoma. The work of the first and second years is given on the academic campus at Norman, a city about 4,000 inhabitants. The work of the third and fourth years is given in Oklahoma City, which has a population of 91,258 and which is eighteen miles north of Norman.

Students intending to practice medicine in Oklahoma, in addition to a four-year high school education, must complete two years of work in an approved college of liberal arts, including courses in physics, chemistry, biology and a modern language prior to beginning the study of medicine.

Norman and Oklahoma City

UNIVERSITY OF OKLAHOMA SCHOOL OF MEDICINE.—Organized in 1900. Gave only the first two years of the medical course at Norman until 1910, when a clinical department was established at Oklahoma City. It has a faculty of 36 professors and 34 instructors, a total of 70. Two years of collegiate work are required for admission. The course is four years of nine months each. An optional course of six years is offered for the degree of B.S. and M.D. The total fees for the four years are, respectively, $60, $60, $25 and $25. The Dean is Dr. Leroy Long, 325 East Fourth Street, Oklahoma City. The total registration for 1920-1921 was 103; graduates, 17. The session begins Sept. 19, 1921, and ends June 6, 1922.

OREGON

Oregon, population 783,389, has one medical college, the University of Oregon Medical School, located in Portland, a city of 258,288 population.

Portland

UNIVERSITY OF OREGON MEDICAL SCHOOL, Marquam Hill.—Organized in 1887. The first class graduated in 1888. A class graduated each subsequent year except 1898. Became an integral part of the University of Oregon in 1910. The Willamette University Medical Department was merged in 1913. It has a faculty of 46 professors and 35 lecturers, assistants, etc., a total of 81. Entrance requirements are two years of college work or its equivalent. The course is four years of eight months each. The total fees for the four years are, respectively, $165, $160, $160 and $160. The Dean is Dr. Richard B. Dillehunt. The total registration for 1920-1921 was 131; graduates, 16. The thirty-fifth session begins Oct. 3, 1921, and ends June 1, 1922.

PENNSYLVANIA

Pennsylvania, population 8,720,159, has six medical colleges. Of these, Philadelphia, having a population of 1,823,779, contains five, as follows: University of Pennsylvania School of Medicine, Jefferson Medical College, Hahnemann Medical College and Hospital, Woman's Medical College of Pennsylvania and Temple University Department of Medicine. The other school, the School of Medicine of the University of Pittsburgh, is situated in Pittsburgh, a city of 588,193.

Students intending to practice medicine in Pennsylvania, in addition to a four-year high school education, must complete a year's work in an approved college of liberal arts, including college courses in physics, chemistry and biology, before beginning the study of medicine. He must also have completed an internship of at least one year in an approved hospital.

Philadelphia

UNIVERSITY OF PENNSYLVANIA SCHOOL OF MEDICINE, Thirty-Sixth Street and Hamilton Walk.—Organized in 1765. Classes were graduated in 1768 and in all subsequent years except 1772-1779, inclusive. The original title was the Department of Medicine, College of Philadelphia. The present title, School of Medicine of the University of Pennsylvania, was adopted in 1909. It granted the first medical diploma issued in America. In 1916 it took over the Medico-Chirurgical College of Philadelphia to develop it as a graduate school. The faculty consists of 57 professors, associate, adjunct and assistant professors, and 156 lecturers, associates, instructors, etc., a total of 213. The requirements for admission are a standard four-year high school course or its equivalent, plus two years of work in an approved college of arts and science, including courses in French or German, and in physics, chemistry and general biology or zoology, with appropriate laboratory exercises. The first and second year classes are limited to 100 students; third and fourth to 125 each. The course embraces four years of study of thirty-four weeks each. The total fees for each of the four years are, respectively, $348, $320, $320 and $324. The Dean is Dr. William Pepper. Total registration for 1920-1921 was 433; graduates, 118. The one hundred and fifty-sixth session begins Sept. 30, 1921, and ends June 21, 1922.

JEFFERSON MEDICAL COLLEGE, Tenth and Walnut Streets.—Organized in 1825 with its present title as the Medical Department of Jefferson College, Cannonsburg, Pa. Classes have been graduated annually since 1826. In 1838 a separate university charter was granted without change of title, since which time it has continued under the direction of its own board of trustees. It has a faculty of 45 professors, associate and assistant professors, and 45 associates, lecturers, demonstrators and instructors, a total of 175. Entrance requirements are a completed standard four-year high school or college preparatory course, or the equivalent, and in addition two years of work leading to a degree in an approved college of arts and science amountng to at least 60 semester hours, including specified courses in physics, general and organic chemistry and biology, with laboratory work in each subject. The course of study covers four years of eight and a half months each. The fees are about $325 each year, with a matriculation fee of $5 paid on admission. The Dean is Dr. Ross V. Patterson. The total registration for 1920-1921 was 514; graduates, 114. The ninety-seventh session begins Sept. 21, 1921, and ends June 2, 1922.

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA, Twenty-First and N. College Avenue.—Organized in 1850. Classes were graduated in 1852 and in all subsequent years except 1862. It has a faculty of 14 professors and 46 assistants, lecturers, etc., in all 60. Entrance requirements are a completed course in a standard secondary school, and in addition two years of collegiate work, including courses in physics, chemistry, biology and French or German. The curriculum covers four years of eight months each. Fees for each of the four years are, respectively, $198, $202, $200 and $182. The Dean is Dr. Martha Tracy. The total registration for 1920-1921, was 103; graduates, 15. The eighty-second session begins Sept. 28, 1921, and ends June 14, 1922.

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL OF PHILADELPHIA, 220-24 North Broad Street.—Organized in 1848 as the Homeopathic Medical College of Pennsylvania. In 1869 it united with the Hahnemann Medical College of Philadelphia, taking the latter title. Assumed present title in 1885. The first class graduated in 1849. Entrance requirements are a completed course in a standard secondary school and in addition two years devoted to a college course, including English and either French, German or Spanish, physics, chemistry and biology. It has a faculty of 34 professors and 63 lecturers, instructors, etc., in all 97. The work covers four years of eight and a half months each. Total fees are $245 each year. The Dean is Dr. William A. Pearson. The total registration for the college year 1920-1921 was 152; graduates, 49. The seventy-fourth session begins Sept. 26, 1921, and ends June 1, 1922.

THE TEMPLE UNIVERSITY SCHOOL OF MEDICINE, Eighteenth and Buttonwood Streets.—Organized in 1901. The first class graduated in 1904. The faculty numbers 103. Two years of college work are required for admission. The fees for each of the four years, respectively, are $175, $170, $160 and $170. The Dean is Dr. Frank C. Hammond. The total registration for 1920-1921 was 74; graduates, 25. The twenty-first session begins Sept. 19, 1921, and ends June 15, 1922.

Pittsburgh

UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE, Bigelow Boulevard.—Organized in 1886, as the Western Pennsylvania Medical College and in 1908 became an integral part of the University of Pittsburgh, removing to the university campus in 1910. The first class graduated in 1887. The faculty is composed of 15 professors and 104 associates, assistants, etc., 119 in all. Entrance requirements are two years of college work, including English, chemistry (inorganic and organic), physics, biology and a reading knowledge of French or German, Italian or Spanish. The course of study is four years of eight and a half months each. The total fees for the four years, respectively, are $325, $310, $310 and $310. The Dean is Dr. Raleigh R. Huggins. The total registration for 1920-1921 was 157; graduates, 34. The thirty-sixth session begins Sept. 26, 1921, and ends June 14, 1922.

SOUTH CAROLINA

South Carolina, population 1,683,662, has one medical college, situated in Charleston, a city of 65,957 people.

Students intending to practice medicine in South Carolina must complete, in addition to 14 units of high school work, two years in an approved college, including courses in English, physics, chemistry and biology.

Charleston

THE MEDICAL COLLEGE OF THE STATE OF SOUTH CAROLINA, 16 Lucas Street.—Organized in 1823 as the Medical College of South Carolina. The first class graduated in 1825. In 1832 a medical college bearing the present title was chartered and the two schools continued as separate institutions until they were merged in 1838. Classes were graduated in all years except 1862 to 1865, inclusive. In 1913, by legislative enactment, it became a state institution. It has a faculty of 34 professors and 27 lecturers, instructors, etc., a total of 61. The course covers four years of eight months each. Two years of collegiate work including courses in physics, chemistry, biology and a modern foreign language are required for admission, in addition to a standard high school preparation. The total fees are $150 annually. The Dean is Dr. Robert Wilson, Jr. Total enrolment for 1920-1921 was 80; graduates, 10. The ninety-third session begins Sept. 22, 1921, and ends June 1, 1922.

SOUTH DAKOTA

South Dakota, population 635,839, has one medical college, the University of South Dakota College of Medicine, located at Vermilion, a town of 2,590 people.

Students intending to practice medicine in South Dakota must show that they matriculated in and graduated from medical colleges which required at least two years of collegiate work for admission, including courses in physics, chemistry, biology and a modern language.

Vermilion

UNIVERSITY OF SOUTH DAKOTA COLLEGE OF MEDICINE.—Organized in 1907. Offers only the first two years of the medical course. Two years' work in a college of liberal arts are required for admission. The fees are $60 each year. The faculty numbers 11. The Dean is Christian P. Lommen, B.S. The total registration for 1920-1921 was 32. The fifteenth session begins Sept. 19, 1921, and ends June 17, 1922.

TENNESSEE

Tennessee, population 2,337,459, has four medical colleges. Of these, Vanderbilt University School of Medicine and Meharry Medical College are situated in Nashville, a city with a population of 118,342. The College of Medicine of the University of Tennessee and the University of West Tennessee College of Medicine and Surgery are located in Memphis, population 162,351.

Students intending to practice medicine in Tennessee must complete two years of collegiate work, including courses in physics, chemistry, biology and a modern language, in addition to a four-year high school course, before entering on the study of medicine.

Memphis

UNIVERSITY OF TENNESSEE COLLEGE OF MEDICINE, three buildings, 879 Madison Avenue.—Organized in 1876 at Nashville as Nashville Medical College. First class graduated 1877, and a class graduated each subsequent year. Became Medical Department of University of Tennessee in 1879. In 1909 it united with the Medical Department of the University of Nashville to form the joint Medical Department of the Universities of Nashville and Tennessee. This union was dissolved in 1911. The trustees of the University of Nashville by formal action of that board named the University of Tennessee College of Medicine as its legal successor. In 1911 it moved to Memphis, where it united with the College of Physicians and Surgeons. The Memphis Hospital Medical College was merged in 1913. Lincoln Memorial University Medical Department was merged in 1914. The faculty includes 42 professors and 44 assistants, instructors, etc., a total of 42. Entrance requirements are a high school education plus two years of collegiate work. Students taking the two-year premedical course in Knoxville may secure the B.S. and M.D. degrees. The total fees for the four years, respectively, are $117, $102, $102 and $127 for bona fide residents of the state, and $50 more each year for nonresidents. The Acting Dean is Dr. James B. McElroy. Total registration for 1920-1921 was 55; graduates, 26. The next session begins Sept. 30, 1921, and ends June 12, 1922.

UNIVERSITY OF WEST TENNESSEE MEDICAL DEPARTMENT, Colored. 1190 South Phillips Place.—Organized in 1900. The first class graduated in 1904, and a class graduated each subsequent year. Total registration for 1920-1921 was 12; graduates, 5. *Official reports indicate that the diplomas of this college are not recognized by the licensing boards of Tennessee and forty-three other states.*

Nashville

VANDERBILT UNIVERSITY SCHOOL OF MEDICINE.—This school was founded in 1874. The first class graduated in 1875. The faculty consists of 42 professors and 46 lecturers, a total of 88. One year of collegiate work is required for admission. The course covers four years of nearly eight and a half months each. The total fees for the four years, respectively, are $182, $168, 165 and $190. The Acting Dean is Dr. Lucius E. Burch. The total registration for 1920-1921 was 144; graduates, 40. The forty-eighth session begins Sept. 28, 1921, and ends June 14, 1922.

MEHARRY MEDICAL COLLEGE. Colored. 1118 First Avenue, South.—This school was organized in 1876 as the Medical Department of Central Tennessee College, which became Walden University in 1900. First class graduated in 1877. Obtained new charter independent of Walden University in 1916. The faculty is made up of 13 professors and 14 instructors, demonstrators, etc., 27 in all. The work embraces four years of thirty-two weeks each. The total fees for each of the first three years are $112 and for the fourth year $127. The President is Dr. John J. Mullowney. Total registration for 1920-1921 was 200; graduates, 41. The forty-sixth session begins Oct. 3, 1921, and ends May 25, 1922.

TEXAS

Texas, population 4,661,027, has two medical colleges. The University of Texas School of Medicine is located at Galveston, a city of 44,255 inhabitants. The Baylor University College of Medicine is located in Dallas, population 158,976.

Students intending to practice medicine in Texas must complete at least a year of collegiate work, including courses in physics, chemistry, biology and modern language, in addition to a standard four-year high school course, before entering on the study of medicine.

Dallas

BAYLOR UNIVERSITY COLLEGE OF MEDICINE, 720 College Avenue.—Organized in 1900 as the University of Dallas Medical Department. In 1903 it took its present name and became the Medical Department of Baylor University. It acquired the charter of Dallas Medical College in 1904. The first class graduated in 1901. The faculty consists of 36 professors and 56 instructors and assistants, a total of 92. Entrance requirement are two years of college work in addition to a four-year high school education. The course is four years of eight months each. The fees for each of the four years, respectively, are $195, $190, $190 and $190. The Dean is Dr. McIver Woody. Total registration for 1920-1921 was 130; graduates, 40. The twenty-second session begins Sept. 26, 1921, and ends May 30, 1922.

Galveston

UNIVERSITY OF TEXAS SCHOOL OF MEDICINE, Avenue B, between Ninth and Tenth Streets.—Organized in 1891. The first class graduated in 1892. It has a faculty of 21 professors and 18 lecturers and instructors, a total of 39. The curriculum embraces four years of eight months each. The entrance requirement is two years of collegiate work in addition to a four year high school education. The total fees for the four years, respectively, are $88, $58, $40 and $27 for residents of the state; $150 each year additional for nonresidents. The Dean is Dr. William S. Carter. Total registration for 1920-1921 was 217; graduates, 26. The thirty-first session begins Oct. 1, 1921, and ends May 31, 1922.

UTAH

Utah, population 449,446, has one medical college, the School of Medicine of the University of Utah, situated at Salt Lake City, which has 118,110 people.

Students intending to practice medicine in Utah, in addition to a four-year high school education, must complete at least one year of collegiate work, including courses in physics, chemistry and biology, prior to beginning the study of medicine.

Salt Lake City

UNIVERSITY OF UTAH SCHOOL OF MEDICINE.—Organized in 1906. Gives only first two years of medical course. Each course covers thirty-six weeks. Two years of collegiate work are required for admission. The medical faculty consists of 11 professors and 15 lecturers and assistants, a total of 26. The fees are $130 each year. The Dean is Dr. Perry G. Snow. Total registration for 1920-1921 was 55. The fifteenth session begins Sept. 22, 1921, and ends June 6, 1922.

VERMONT

Vermont, population 352,421, has one medical school, located at Burlington, a town of 22,779 people.

Students who desire to practice medicine in Vermont, in addition to a standard four-year high school education, must complete two years of collegiate work, including college courses in physics, chemistry and biology, before entering on the study of medicine.

Burlington

UNIVERSITY OF VERMONT COLLEGE OF MEDICINE, Pearl Street, College Park.—Organized with complete course in 1822. Classes graduated in 1823 to 1836, inclusive, when the school was suspended. It was reorganized in 1853 and classes were graduated in 1854 and in all subsequent years. The faculty numbers 41. Two years of college work in addition to a four-year high school education are required for admission. The course of study covers four years of nine months each. The total fees for each of the first three years are $200 and $225 for the fourth

year. The Dean is Dr. H. C. Tinkham. The total registration for 1920-1921 was 103; graduates, 36. The next session begins Sept. 21, 1921, and ends June 19, 1922.

VIRGINIA

Virginia, population 2,306,361, has two medical colleges, one, the Department of Medicine of the University of Virginia, situated in Charlottesville, population 10,688, and the Medical College of Virginia at Richmond, population 171,667.

Students desiring to practice in Virginia must be graduates of medical colleges which require that all students admitted shall have completed two years of collegiate work, including courses in physics, chemistry, biology and a modern language, preferably German, in addition to a four-year high school education.

Charlottesville

UNIVERSITY OF VIRGINIA DEPARTMENT OF MEDICINE.—Organized in 1827. Classes were graduated in 1828 and in all subsequent years except 1865. It has a faculty of 19 professors and 26 lecturers, instructors, assistants, etc., a total of 45. The requirements for admission are the completion of a four-year high school course, or its equivalent, and two years of college work devoted to English, mathematics, chemistry, physics and biology, and French or German. Total fees for the four years, respectively, are $205, $207.50, $165 and $150. The Dean is Dr. Theodore Hough. The total registration for 1920-1921 was 130; graduates, 20. The ninety-third session begins Sept. 15, 1921, and ends June 13, 1922.

Richmond

MEDICAL COLLEGE OF VIRGINIA, Marshall and College Streets.—Organized in 1838 as the Medical Department of Hampden Sydney College. Present title was taken in 1854. In 1913 the University College of Medicine was merged. In 1914 the North Carolina Medical College was merged. Classes were graduated in 1840 and in all subsequent years. It has a faculty of 43 professors and 56 lecturers, instructors, etc., a total of 99. The requirement for admission is a four-year high school education and in addition two years of collegiate work, including courses in physics, chemistry, biology and French or German. The course embraces four years of eight months each. Total fees for the four years, respectively, are $220, $220, $220 and $250. The Dean is Dr. E. C. L. Miller. The total registration for 1920-1921 was 168; graduates, 30. The ninety-third session begins Sept. 14, 1921, and ends May 30, 1922.

WEST VIRGINIA

West Virginia, population 1,463,610, has one medical college, the School of Medicine of West Virginia University, which offers the first two years of the medical course. It is located at Morgantown, a city of 12,117 population.

Students who desire to practice medicine in West Virginia must complete, in addition to a high school education, two years of collegiate work, including courses in physics, chemistry and biology, before entering on the study of medicine.

Morgantown

WEST VIRGINIA UNIVERSITY SCHOOL OF MEDICINE.—Organized in 1902, and gives only the first two years of the medical course. Two years of college work are required for admission and the Bachelor's degree will be granted to those who finish the two years in medicine. Session extends through nine months. The faculty numbers 15. Fees: For residents of the state, $50 each year; for nonresidents, $200. Cadets pay laboratory fees only. The Dean is Dr. John N. Simpson. The total registration for 1920-1921 was 78. The next session begins Sept. 19, 1921, and ends June 13, 1922.

WISCONSIN

Wisconsin, population 2,631,839, has two medical colleges, the Medical School of the University of Wisconsin, which teaches the first two years of the medical course, and is located at Madison, a city of 38,378 people, and the Marquette University School of Medicine, located at Milwaukee, a city of 457,147 people.

Students intending to practice medicine in Wisconsin, prior to entering a medical school, must complete, besides a four-year high school course, two years of collegiate work, including courses in physics, chemistry, biology and a modern language.

Madison

UNIVERSITY OF WISCONSIN MEDICAL SCHOOL.—Organized in 1907. Gives only the first two years of the medical course. The teaching of the third will be given in the fall of 1923, and of the fourth year in 1924. For matriculation at least two years in a college of arts and science or an equivalent training are required, including two years of Latin, a reading knowledge of French or German, and at least a year's work in physics, chemistry and biology. It has a faculty of 17 profsesors and 42 lecturers, instructors, etc., a total of 59. Tuition fees: for residents of the state, $90 each year; for nonresidents, $214. The Dean is Dr. Charles R. Bardeen. The registration for 1920-1921 was 161. The fourteenth session begins Sept. 19, 1921, and ends June 10, 1922.

Milwaukee

MARQUETTE UNIVERSITY SCHOOL OF MEDICINE, Fourth Street and Reservoir Avenue.—Organized in December, 1912, by the merger of the Milwaukee Medical College and the Wisconsin College of Physicians and Surgeons. It has a faculty of 98. The entrance requirements are two years of college work, including courses in physics, chemistry, biology and a modern language. The curriculum covers four years of eight and a half months each. The total fees for each year are $300. The Dean is Dr. Louis F. Jermain; the Dean of students is Dr. Eben J. Carey. The registration for 1920-1921 was 142; graduates, 17. The tenth session begins Oct. 3, 1921, and ends June 1, 1922.

PHILIPPINE ISLANDS

The Philippine Archipelago, having a population (estimated 1918) of 9,009,802, has two medical colleges, the University of the Philippines College of Medicine and Surgery and the Medical Faculty of the University of St. Thomas. They are located in the city of Manila, which in 1914 had a population of 266,943.

Manila

UNIVERSITY OF THE PHILIPPINES COLLEGE OF MEDICINE AND SURGERY, Manila.—Organized in 1907 as the Philippine Medical School, under the support of the government of the Philippine Islands. Present title in 1910. The faculty includes 35 professors and 36 lecturers, assistants, etc., a total of 71. A two-year collegiate course leading to the degree of bachelor of arts is required for admission, including courses in English, physics, chemistry, biology and either French or German. The course extends over five years. In the fifth year the students are assigned as clinical clerks in the Philippine General Hospital. The Dean is Dr. Fernando Calderon. The total registration for 1920-1921 was 139; graduates, 23. The fifteenth session began July 1, 1921, and ends April 4, 1922.

CANADA

The Dominion of Canada has nine medical colleges, five of which require a six-year course, including courses in physics, chemistry and biology. This course is practically equal to that in the colleges of the United States which require two years of college work for admission, including the science courses named.

Alberta

UNIVERSITY OF ALBERTA, FACULTY OF MEDICINE, Edmonton.—Organized in 1913. Offers the first four years of the six-year medical course, including the two preliminary science years. The faculty numbers 47. Fees for the first year are $75; for the second, third and fourth years, each $100. The registrar is Cecil E. Race, B.A. The registration for 1920-1921 was 175. The ninth session begins Sept. 26, 1921, and ends May 12, 1922.

Manitoba

UNIVERSITY OF MANITOBA FACULTY OF MEDICINE, WINNIPEG.—Organized in 1883 as Manitoba Medical College; first class graduated in 1886, and a class graduated each subsequent year. The college transferred all its property to the University of Manitoba in 1919 and assumed the present title. The faculty numbers 111. The total fees for the five years, respectively, are $155, $150, $160, $160 and $160. Matriculation requirements include one year of college work in the Faculty of Arts and Science of a recognized university subsequent to the complete high school course required for entrance to the latter. The first undergraduate year includes courses in advanced chemistry and zoology. The courses in physics and botany are completed in the premedical college year. The Dean is Dr. S. Willis Prowse. Total registration for 1920-1921 was 266; graduates, 34. The next session begins Sept. 14, 1921, and ends April 24, 1922.

Nova Scotia

DALHOUSIE UNIVERSITY, FACULTY OF MEDICINE, Halifax, N. S.—Organized in 1867. Incorporated as the Halifax Medical College in 1875. Reorganized as an examining faculty, separate from the Halifax Medical College in 1855. In 1911, in accordance with an agreement between the Governors of Dalhousie University and the Corporation of the Halifax Medical College, the work of the latter institution was discontinued and a full teaching faculty was established by the University. By an arrangement between Dalhousie University and the Provincial Medical Board of Nova Scotia, the final professional examinations are conducted conjointly by the university and the board, and candidates may qualify at the same time for their academic degrees and the provincial license. First class graduated in 1872. It has a faculty of 48 professors, lecturers and demonstrators. Requires matriculation, examination and a graded course of five years, including premedical courses in physics, chemistry and biology. The fees are $175 each year. The total registration for 1920-1921 was 161; graduates, 16. The Dean is Dr. John Stewart. The next session begins Oct. 5, 1921, and ends May 27, 1922.

Ontario

UNIVERSITY OF TORONTO, FACULTY OF MEDICINE, Toronto.—Organized in 1843 as the Medical Faculty of King's College. Abolished in 1853. Reestablished in 1887. In 1902 it absorbed Victoria University, Medical Department, and in 1903 absorbed Trinity Medical College. The course of study covers six years of eight months each, the first two being devoted largely to physics, chemistry, biology and cultural courses in history, science and English. It has a faculty of 61 professors and 195 lecturers, associates, etc., a total of 256. The fees are $161 each year; graduation fee, $20. The Dean is Dr. A. Primrose. The total registration for 1920-1921 was 1,106; graduates, 143. The next session begins Sept. 27, 1921, and ends May 31, 1922.

QUEEN'S UNIVERSITY FACULTY OF MEDICINE, Kingston.—Organized 1854, first class graduated in 1855, and a class graduated each subsequent year. The faculty was originally a department of the university, but a separation took place in 1866, when the school was conducted under the charter of the Royal College of Physicians and Surgeons at Kingston. In 1892 the school again became an integral part of Queen's University. The faculty includes 26 professors and 24 assistants, instructors, etc., a total of 50. The fees for the six years are, respectively, $130, $135, $135, $144, $144 and $134; fee for M.D., C.M. degrees, $30. The course covers six years of thirty teaching weeks each, the first year including courses in physics, chemistry, biology, English and French or German. The total registration in 1920-1921 was 240; graduates, 40. The Dean is Dr. J. C. Connell. The next session begins Sept. 28, 1921, and ends May 26, 1922.

WESTERN UNIVERSITY, FACULTY OF MEDICINE, London.—Organized in 1881, first class graduated in 1883, and a class graduated each subsequent year. The medical school has been under the control of the Board of Governors of the Western University since 1913. The faculty numbers 53. The course is six years, of eight months each, the first year including premedical courses in physics, chemistry and biology. Beginning with the session of 1923-1924 two years of premedical college work will be required followed by a four year medical course. The total fees for the six years, respectively, are $150, $145, $145, $153, $153 and $178. The Acting Dean is Dr. Paul S. McKibben. Total registration for 1920-1921 was 137; graduates, 12. The next session begins Oct. 4, 1921, and ends May 26, 1922.

Montreal

MCGILL UNIVERSITY, FACULTY OF MEDICINE.—Founded 1824 as Montreal Medical Institution; became the Medical Faculty of McGill University in 1829; first class graduated under the university auspices in 1833. No session between 1836-1839 owing to political troubles. In 1905 it absorbed the Faculty of Medicine of the University of Bishop College. The course extends over six years of eight months each, including the two preliminary years. The faculty numbers 145. The total fees each year are $200. The total registration for 1920-1921 was 708; graduates, 99. The Assistant Dean is Dr. John W. Scane. The next session begins Oct. 1, 1921, and ends June 6, 1922.

UNIVERSITY OF MONTREAL MEDICAL FACULTY, Montreal.—Organized in 1843, incorporated in 1845 as the Montreal School of Medicine and Surgery. In 1891, by act of parliament, the Medical Faculty of Laval University (organized in 1878) was absorbed. Present name assumed in 1920. A class was graduated in 1843 and in each subsequent year. The faculty numbers 80. The course extends over six years, including premedical courses in physics, chemistry and biology. The total fees each year are $175. The Dean is Dr. E. P. Lachapelle. The toatl registration for 1920-1921 was 354; graduates, 34. The next session begins Sept. 15, 1921, and ends June 15, 1922.

Quebec

LAVAL UNIVERSITY FACULTY OF MEDICINE, Quebec.—The Quebec School of Medicine, organized in 1848, became in 1852 the Medical Department of Laval University; first class graduated in 1855, and a class graduated each subsequent year. The faculty numbers 35. The fees are $90 each year. The course extends over five years, the first year including courses in physics, chemistry and biology. The Secretary is Dr. Arthur Vallée, Quebec. Total registration for 1920-1921 was 125; graduates, 25.

THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

The requirements for admission to and graduation from colleges holding membership in this association are 15 units of high school work and two years (60 semester hours) of college work.

CURRICULUM: The entire course of four years shall consist of not less than 3,600 hours, and shall be grouped in divisions and subdivided into subjects, each division and each subject to be allotted approximately the number of hours and percentages of the whole shown in the following schedule:

DIVISION I.

ANATOMY, 684 HOURS (19%).	Minimum % of 3,600 Hours.
1. Gross anatomy, including clinical or applied anatomy 2. Microscopic anatomy 3. Embryology	19%

DIVISION II.

PHYSIOLOGY AND CHEMISTRY, 468 HOURS (13%).

1. Physiology	8%
2. Biochemistry	5%

DIVISION III.

PATHOLOGY AND BACTERIOLOGY, 468 HOURS (13%).

1. Pathology, including necropsies	8 %
2. Bacteriology, including serology and immunology	3½%
3. Preventive medicine and public health	1½%

DIVISION IV.

PHARMACOLOGY, 216 HOURS (6%).

1. Materia medica and pharmacy 2. Pharmacology	6%

DIVISION V.

MEDICINE AND MEDICAL SPECIALTIES, 900 HOURS (25%).

1. General medicine, including laboratory diagnosis	15 %
2. Pediatrics	4 %
3. Nervous and mental diseases	3½%
4. Dermatology and syphilis	2 %
5. Medical jurisprudence	½%

DIVISION VI.

SURGERY AND SURGICAL SPECIALTIES, 648 HOURS (18%).

1. Surgery	11 %
2. Orthopedic surgery	2 %
3. Urology	1 %
4. Ophthalmology	1½%
5. Otology, rhinology and laryngology	1½%
6. Roentgenology	1 %

DIVISION VII.

OBSTETRICS AND GYNECOLOGY, 216 HOURS (6%).

1. Obstetrics, including obstetric surgery	4 %
2. Gynecology	2 %

When teaching conditions demand it, a subject may be transferred from one division to another.

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The secretary-treasurer of the Association is Dr. Fred C. Zapffe, 3431 Lexington Street, Chicago.

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Contributors, subscribers and readers will find important information on the second advertising page following the reading matter

SATURDAY, AUGUST 13, 1921

MEDICAL EDUCATION—PROGRESS OF TWENTY-ONE YEARS

We publish this week for the twenty-first consecutive year complete statistics regarding medical education in the United States. During these years, medical education in this country has been completely reorganized and extensive improvements have been made in educational standards. A review of the measures which have brought this about will be of interest.

BEGINNING OF THE CAMPAIGN

In 1900, THE JOURNAL began collecting statistics in regard to medical colleges, students and graduates. The returns of that year were unsatisfactory, however, and the data were not published. In the next year—in 1901—better reports were obtained, and the first Educational Number of THE JOURNAL was published. It was a matter of common knowledge that, of the 159 medical colleges shown in the statistics, many were joint stock corporations conducted largely for the profit of their owners. It was also well known that the majority of colleges paid little or no attention to entrance requirements. Very little was known at that time in regard to the number and qualifications of teachers, the number and equipment of laboratories, the amount and use made of clinical material, or the methods of teaching employed. At that time also, sectarian medicine had reached its zenith, there being twenty-two homeopathic and ten eclectic colleges. The total enrolments in all colleges was 26,417 students, and of these 5,444 were graduated.

With the collection and publication of such data in 1901, the campaign for the improvement of medical education was begun. The information published showed the need of improvement, and furnished the impetus which led to the creation of a permanent committee of the American Medical Association—the Council on Medical Education—to centralize its efforts in this particular work. The statistics were collected and published by THE JOURNAL annually for five years, however, before the Council began active work.

PROGRESS FROM 1906 TO 1910

As one of its functions, the Council on Medical Education naturally took over the work begun by THE JOURNAL of collecting, tabulating and publishing statistics relating to medical education. With a permanent secretary in charge, the Council established files for the information and began a careful and extensive study of medical education. A study of medical education abroad revealed the fact that in all the rest of the world there were 154 medical schools,[1] as compared with 160—a vast oversupply—in the United States, and that, except in a few medical schools, educational standards were much lower than those abroad.[2] This showed the wisdom of the Council's early action in suggesting two educational standards,[3] one for immediate adoption by the medical schools and another, termed "the ideal standard," for later adoption. Mergers of medical schools also were urged in cities or states where two or more existed by which, in each instance, one stronger and better institution might result. An annual conference was held to which all organizations interested in medical education were invited to send delegates. Thus an open floor was established where educational problems were presented for general discussion.

To secure first-hand information in regard to the work of the medical schools, in 1906 a complete tour of inspection was made and the first classification was prepared. This was read at the annual conference and at the meeting of the House of Delegates in 1907, and each college was notified of its position in the classification. Another tour of inspection was made in 1909, and in 1910 the second classification was published.[4] Before this second inspection was made, the number of medical colleges had already been reduced, largely by mergers, from 162 to 131; the number of graduates was reduced from 5,747 to 4,440, and the number of students from 28,142 to 21,526. By this time, also, many of the medical schools had undergone extensive internal development. Entrance standards had been raised; better teachers employed; better buildings erected; new laboratories established, and better clinical facilities secured. Where formerly only four medical schools were requiring any college work for admission, by 1910 thirty-five colleges had adopted that requirement and eight state licensing boards had adopted a similar standard as a minimum requirement of preliminary education. Through these inspections and other means of obtaining data at first hand, the information published each year in the Educational Number was verified and made more reliable.

Following the first inspection of the medical schools, at the suggestion of the Council, the Carnegie Foundation for the Advancement of Teaching consented to make a survey of the medical schools. As a consequence, the second tour of inspection was made jointly by representatives of the Council and the Foundation. In its report, the Carnegie Foundation made no classi-

1. List in J. A. M. A. **49**: 596 (Aug. 17) 1907.
2. See chart in J. A. M. A. **55**: 680 (Aug. 10) 1910.
3. J. A. M. A. **45**: 270 (July 22) 1905.
4. J. A. M. A. **54**: 2061 (June 1) 1910.

fication and suggested no standards; nevertheless, the wide publicity given to the report was of great service in the subsequent campaign.

PROGRESS FROM 1910 TO 1915

By the beginning of the second five-year period, the information regarding all medical colleges, existing and extinct, collected by the Council, was sufficiently complete to permit the publication of a reliable chart[5] by which, for the first time, the number of medical colleges existing in the United States in any year was definitely known from the time the Department of Medicine of the College of Philadelphia—now the University of Pennsylvania—was organized in 1765. Also in 1910, a medical students' register was established in order to secure better records of the histories and educational qualifications of medical students and facts regarding their promotion from class to class. In this work, particularly, the Council received a most hearty and gratifying cooperation from the majority of medical schools. During this period, also, two other complete inspections of medical colleges were made and two new classifications published.

During this second period also twenty medical colleges were merged with others and sixteen became extinct, which further reduced the total number from 131 to ninety-five. The number of medical students was reduced from 21,526 to 14,891, and the total number of graduates from 4,440 to 3,536. The number of medical colleges requiring one or two years of college work for admission was increased from thirty-five (27 per cent.) to eighty-three (88 per cent.), and the number of licensing boards holding to these higher requirements was increased from eight to eighteen. Not only had the majority of medical colleges adopted the higher entrance requirements, but also, through the reliable data collected by the Council, the methods employed by each college in admitting students and the strictness with which the entrance requirements were administered were known with fair accuracy. The Council, therefore, was in position to recognize at once any faulty methods or "paper standards," which were not uncommon before the campaign for improvement began. The continuous agitation for better conditions, aided materially by the report of the Carnegie Foundation, appealed to philanthropists to such an extent that endowments for medical education were greatly increased, and large gifts for medical buildings, new laboratories, scholarships, endowed chairs and teaching hospitals became of frequent occurrence.

The fall of 1914 marked an epoch in the progress of medical education in the United States in that forty-three medical colleges for the first time began the enforcement for admission of a year of college work including courses in physics, chemistry and biology, which was essential for the Council's Class A rating. Thus the standard which in 1905 had been termed "ideal" became the essential standard in 1914.

PROGRESS OF THE LAST SIX YEARS

In 1916, preliminary education was further extended from one to two years of college work in addition to a high school education. In June of that year the Council was instructed by the House of Delegates to retain in Class A after Jan. 1, 1918, only those medical schools which required for admission this higher standard of preliminary education. This ruling was in no way drastic, since already forty-six medical colleges had put that standard into effect and seventeen licensing boards had adopted it as a minimum requirement of preliminary education for those who were to receive licenses to practice medicine.

By 1917, when the United States entered the World War, although the total number of medical schools had been reduced to ninety-six, the number of better and higher grade schools had been largely increased. For several years the majority of graduates had received a much better training as a result of the higher entrance standards and the greatly improved conditions in other respects. It was these recent graduates, meanwhile, who in large proportions entered the government medical services and who became responsible for the medical welfare of America's soldiers and sailors. That the campaign for improvements had made such rapid headway, therefore, was of great benefit to the nation during the war.

The medical students' register was also of special benefit, since it contained the home addresses of the majority of medical students. This made it possible to secure promptly from the students information showing that, unless exempted from the draft, between 60 and 80 per cent. would be called into the army, and many of the medical schools forced to close. The publication of this information led to the creation of the Medical Enlisted Reserve Corps, by which students were to be kept in the medical schools until graduation.

	Medical Colleges				Students				Graduates			
	1904		1921		1904		1921		1904		1921	
Entrance Requirements	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Two years of college work	4	2.5	76	91.6	1,761	6.2	14,319	96.1	369	6.4	3,112	94.4
Four year high school or less *	158	97.5	7	8.4	26,391	93.8	553	3.9	5,378	93.6	180	5.6
Totals	162	....	83	....	28,142	....	14,872	....	5,747	....	3,192	....

* It is probable that in 1904 not more than about thirty medical colleges (18.5 per cent.) were actually requiring a four-year high school education for admission.

5. J. A. M. A. 61: 578 (Aug. 23) 1913.

SUMMARY OF PROGRESS MADE

As a result of this campaign, medical education has been greatly improved. In place of the vast oversupply of medical schools, there are now eighty-three, seventy-six of which are requiring for admission two or more years of collegiate work. Besides the advances in requirements for admission, many other improvements have been made. Endowments have been increased from a few thousands until in recent years gifts of millions have become commonplace. New and larger medical buildings have been erected or entire teaching plants constructed, and more and better equipped laboratories established. Where formerly full-time laboratory teachers were very few, now in the great majority of schools all laboratory staffs are largely made up of full-time teachers. Where formerly many schools were without close hospital affiliations, now every medical school has an affiliated hospital and in most of them the hospital is owned or controlled by the medical school, so far as the teaching material is concerned. The number of students since 1904 was reduced from 28,142 to 14,872;[6] at the same time, the proportion of medical students in well equipped medical colleges has been increased from 3.9 per cent. to 96.1 per cent. Of medical graduates, likewise, although the total has been reduced by 40 per cent., the number coming from high grade, well equipped medical colleges has been increased from 5.6 per cent. to 94.4 per cent.

The progress made in the campaign for the improvement of medical education has been more rapid, and fewer difficulties have been experienced, than were anticipated at the beginning of the campaign. This was due largely to the cordial and ready cooperation by the officers of medical colleges and state licensing boards, both individually and in their national organizations. The publicity secured by the report of the Carnegie Foundation for the Advancement of Teaching aided generally in the campaign and particularly in calling the attention of philanthropists to the financial needs of medical schools. The object sought has been attained and medical education in the United States is now equal to, if it does not surpass, that in any other country.

MEDICAL SUPPORT FOR THE ANTIVIVISECTIONISTS

Concerning the attitude of well-informed persons toward animal experimentation and its benefits to mankind there is no question whatever. Local, national and international medical organizations and both special and general scientific societies have passed strong resolutions, pointing out its beneficent results and urging the danger of limiting its scope and methods. Occasionally, however, there appears the possessor of a medical degree who declares that animal experimentation is only systematic cruelty and who denies that any benefit has ever been derived from it. Such a person is Dr. Walter R. Hadwen of Gloucester, England, who has recently addressed antivivisection societies in New York, Boston, Philadelphia, Washington, Baltimore, Los Angeles and San Francisco. The enthusiasm of these societies over Dr. Hadwen's visit is a measure of the rarity of securing a medical champion of the antivivisection cause.

Reports of Dr. Hadwen's addresses reveal that everywhere he has made the same "points." Animal experimentation is immoral, he declares, because man takes advantage of weaker animals for his own supposed benefit. It is cruel, because there is no assurance that anesthetics are used in such a way as to abolish pain during operations. It is misleading, because anatomically and physiologically there is no analogy between lower animals and man. Thus diseases are not analogous, drug actions are not analogous, and consequently "nothing whatever has been gained by experimentation upon living animals that has ever been of the slightest benefit in the amelioration or cure of any human disease." "The germ theory of disease has not a scientific leg to rest upon." The safety of modern surgery is due solely to "cleanliness." Antityphoid inoculation, he alleges, has ruined men for life by producing kidney disease, heart disease and cerebrospinal meningitis—a result which is costing the annually. Restricting the freedom of "germ carriers" British government in heart disease alone £4,000,000 is "one of the greatest scandals on the face of the earth." Quite logically Dr. Hadwen demands total abolition of experiments on animals.

This is the sort of information and argument on which the antivivisection societies are thriving and building up their morale. Dr. Hadwen's ethical ideas involve no milk to drink and no meat to eat. In this he is at least consistent, for he is an ardent vegetarian. He offers no evidence of ever having been in laboratories and learned there the precautions taken against infliction of pain. He is blind to the facts of comparative anatomy and physiology, that prove the close structural and functional relationship of man and the lower animals. He, a man of 67 years, is unacquainted with the sciences of bacteriology, parasitology and pharmacology—sciences which have developed since he was a young man and which by animal experimentation have revealed both the nature of disease processes and effective modes of dealing with them. He has ridiculed and denounced the well-established facts and the well-tried methods which enlightened states employ for the treatment of their sick (e. g., diphtheria antitoxin), which permitted the building of the Panama Canal, which have reclaimed vast areas of the earth for human habitation, and which are universally employed in civilized societies for the protection of public health. All this is of no significance to the antivivisectionists, however, for Hadwen is *Doctor* Hadwen, and, as such, speaks with authority.

6. The lowest number was 13,052 in 1919; enrolments are again on the increase.

It would be foolish to pay any attention whatever to the remarks of our English visitor if they did not have the effect of misleading people, men and women, who have votes. There is no doubt that if antivivisection propaganda continues unchallenged, the experimental method in medicine will be seriously endangered. There is no doubt, also, that the experimental method is as fundamentally important to medicine as it is to physics or chemistry. Its limitation or abolition would be a grave calamity for man and for lower animals as well. No group can be more influential in protecting it than physicians who are in daily contact with patients. Every physician should know and teach the facts on which Osler's dictum is based, that in the half century between 1850 and 1900 the "experimental study of physiology and pathology did more to emancipate medicine from the routine and thraldom of authority than all the work of all the physicians from the days of Hippocrates to Jenner." [1]

THE PELLAGRA PROBLEM

Famine and pestilence have long been known to follow in the wake of war, and history records many instances of disease as a consequence of the failure of certain highly essential crops in regions where the variety of foods is considerably limited. Without potatoes, for example, the people of Labrador do not thrive on a diet preponderating in wheat flour. It cannot come as a complete surprise, therefore, that the menace of ill health may arise as the result of acute economic conditions in any part of this country. Outbreaks of scurvy have not been unknown. During recent years the medical profession has had repeated warning of the insidious possibilities of pellagra in the United States.

The statistics in preparation relative to the actual evidence of pellagra will doubtless bring clarity and help to allay the deep resentment which has been awakened in regard to the widespread publication of what is regarded by many residents of the South as an unjustifiable report. In any event, fortunately, the scientific investigations, for the success of which American experts have been so largely responsible, have pointed the way to avert or relieve pellagra through appropriate dietary measures which have repeatedly been discussed in THE JOURNAL.[2] It is recognized that the incidence of the disease in our Southern states usually reaches its maximum in the early summer and then subsides as fresh vegetables and other food products become more abundant and less expensive. Whatever the accepted hypothesis of causation may be, there is no lack of evidence to indicate that the inclusion of a more liberal supply of good protein and sources of certain vitamins in the diet is likely to be beneficial in the case of pellagrins whose regimen almost invariably is deficient in the factors just emphasized. If pellagra should ever become a real menace to the extent of involving large numbers of persons, regional pride will surely not stand in the way of any worthy movement for the cause of better national health.

The present situation should not be allowed to pass without bringing the medical profession to a better realization that scientific opinion is not yet united with respect to the etiology of pellagra. The zeistic theory has practically been abandoned, so that moldy corn is no longer charged with chief responsibility for the malady. On the other hand, there are investigators of recognized standing who are still unwilling to accept the current "deficiency disease" hypothesis as an adequate explanation of the genesis of pellagra. They look upon the latter as in all probability a specific infectious disease communicable from person to person by means at present unknown. To the supporters of this conclusion, betterment of sanitation, which is admittedly crude in many of the localities affected, appeals more strongly than the dietary considerations already cited. In view of this it becomes imperative to ascertain beyond question, if possible, what the real cause of pellagra is, and whether it can surely be arrested by diet alone or by sanitary reform or both.

Elsewhere in this issue [3] appears an abstract of the resolutions adopted by the pellagra conference just held in Washington. The resolution reveals a desire to cooperate in stamping out the pellagra menace and a wholesome conservative attitude on the part of health officers who are not to be stampeded by any unwarranted phobia. The medical profession is prepared to do its best and asks only for public cooperation and support of its efforts. Investigation requires support, and this should be offered promptly in no stinted measure. A nation whose chewing gum bill mounts into millions of dollars can surely afford more than the meager sums voted by Congress for pellagra research and relief.

1. Pamphlets published by the American Medical Association, showing the relations of animal experimentation to practical medicine and surgery, may be had at the headquarters of the Association.

2. Goldberger, Joseph: Pellagra: Causation and a Method of Prevention, J. A. M. A. **66**: 471 (Feb. 12) 1916. Nesbitt, C. T.: Sanitation and the Control of Pellagra, ibid. **66**: 647 (Feb. 26) 1916. Observations on the Chemical Symptoms of Pellagra, editorial, ibid. **66**: 1311 (April 22) 1916. Wood, E. J.: Vitamin Solution of the Pellagra Problem, ibid. **66**: 1447 (May 6) 1916. Pellagra in Nashville, editorial, ibid. **66**: 1704 (May 27) 1916; Is Pellagra Transmissible? ibid. **68**: 39 (Jan. 6) 1917; Experimental Pellagra, ibid. **69**: 1082 (Sept. 29) 1917. Jobling, J. W., and Maxwell, E. S.: The Alkali Reserve in the Blood of Pellagrins, ibid. **69**: 2026 (Dec. 15) 1917. Petersen, W. F.: The Mortality from Pellagra in the United States, ibid. **69**: 2096 (Dec. 22) 1917. Goldberger, Joseph; Wheeler, G. A., and Sydenstricker, Edgar: A Study of the Diet of Nonpellagrous and of Pellagrous Households in Textile Mill Communities in South Carolina in 1916, ibid. **71**: 944 (Sept. 21) 1918. Pellagra, editorial, ibid. **74**: 1520 (May 29) 1920; Pellagra in Egypt, ibid. **75**: 321 (July 31) 1920.

3. General News, this issue, p. 564.

Practical Knowledge of Tuberculosis Treatment.—How many medical students, on qualifying as practitioners, are really competent to advise from practical acquaintance on one of the many special forms of treatment specially indicated for any particular subject of tuberculous disease at a particular phase of the infections? Yet such knowledge is often a matter of life or death to the patient, and what opportunities will he have for acquiring such knowledge?—H. Ganvain. *Brit J. Tuberc.* **15**:3, 1921.

Current Comment

REQUIREMENTS FOR ADMISSION TO MEDICAL SCHOOLS

In the last twenty years the requirements for admission to medical schools have been raised from a high school education or less—and mostly less—to two years of college work as a minimum. This advance places the entrance requirements of medical schools in the United States on a par with the requirements in other countries. It is generally recognized that secondary school courses in Europe are equal to the four-year high school course plus between one and two years of collegiate work in the United States. In this country, courses with laboratory work in physics, chemistry and biology are required to be included in the two years of college work. In most foreign countries, courses in these subjects are counted as a part of the regular medical school curriculum, although the subjects are usually taught in the science schools of the universities. In most countries abroad the medical course extends over six or seven years beyond the secondary school. In this country the two years of college work, plus the four years in medical school, likewise constitute a six-year course beyond the high school, or seven years if the intern year is counted. There are special advantages in requiring that the two years of college work be completed before the student enters the medical school: (*a*) The physics, chemistry and biology are taught in the college of science without reference to their special bearing on medicine. This is considered advisable, since it is not known at present what particular facts obtained in the study of these sciences will be most useful in medical research in later years. (*b*) The majority of students now enter medical schools by way of the colleges of arts and sciences; they have had the benefit of two years in the influence, the atmosphere and the social life of the college and in contact with students preparing for other professions and callings, the benefit of which is incalculable. (*c*) The student is left free to make a final choice of medicine as his life work until the end of these two years of college preparation, and contact with students in other callings enables him to choose intelligently that for which he is best fitted. The only criticism now voiced against present requirements for admission to medical schools is the time element involved. The time will subsequently be further shortened, however, by the increasing tendency in grammar schools to permit students of more than average ability to complete such work in six instead of eight years. With the more general adoption of this practice, students will enter college and will graduate in medicine two years earlier, or at 23 or 24 years of age rather than at 26, as at the present time—or 27, counting the intern year. Meanwhile, the higher entrance requirements now generally enforced by medical schools were one of the most essential factors in developing medical education in the United States so that it now equals, if it does not surpass, that of any other country.

VITAMINS: THEIR DISTRIBUTION

Our knowledge of the accessory food factors, commonly spoken of as vitamins, is so recent, comparatively speaking, and the exact nature of these factors still so enveloped in mystery, that it was inevitable that the public's lack of knowledge on the subject should be capitalized. It is not surprising that there are on the market a number of preparations of the "patent medicine" type that are being sold under the claim that they are rich in vitamins—although the exploiters of these fail to explain which, if any, of the three accessory food factors their products contain. The renaissance of yeast as a therapeutic agent has given an opportunity to the manufacturers of this product of unduly stressing the fact that yeast is particularly rich in the antineuritic vitamin (water-soluble B). Because milk and certain milk products are rich in the fat-soluble A factor, the dairy interests would apparently have the public believe that this particular vitamin is to be obtained only from their products. Thus, a journal [1] devoted to the dairy interests recently claimed that those who want vitamins must get them in their milk, butter, cheese and other milk products. The truth is, the accessory food factors are so well distributed throughout the dietary of modern man that, generally speaking, the individual who uses ordinary judgment in selecting his food is in no danger of suffering from a deficiency of any of these three factors. It would be well if every physician might read the excellent monograph on the present state of knowledge concerning accessory food factors written by a committee appointed jointly by the Lister Institute and Medical Research Committee. In this report the distribution of the vitamins in our common foodstuffs is thus briefly summarized: ". . . broadly speaking it is safe to say that the individual always finds a sufficient supply of vitamines in his food so long as that food is reasonably varied and has received no artificial or accidental separation into parts, and so long as no destructive influence has been applied to it." At the end of the committee's report is a table showing the distribution of the three accessory factors in the commoner foodstuffs. This table is reproduced on page 571 of this issue. It is well worth studying.

INFORMATION FOR PROSPECTIVE MEDICAL STUDENTS

One of the functions assumed by the Council on Medical Education has been the publishing of reliable information to guide prospective medical students in their selection of a medical school. One needs but to recall the amazing variety of medical schools twenty or more years ago to realize the many pitfalls in the path of the unwary student. Formerly there was no way by which the student could easily ascertain the character and standing of a medical school. He could not discover whether or not it was properly equipped to furnish a satisfactory training or whether its diploma was recognized by state licensing boards. Instances are not lacking of students who attended

1. Pacific Dairy Review, May 19, 1921.

medical schools throughout the four years, graduated and applied for their licenses before they found out that the institutions were "not recognized" by the boards in the states where they wished to practice. Of course, the medical schools not recognized did not mention the fact in their announcements. The only information for the student was that furnished by the medical colleges themselves; and, as a rule, the lower the grade of the school, the more pretentious were its announcements. For this reason, the average student was more likely to select the poorer than the better school. Since 1904, however, the situation has been decidedly changed. Much information has been published in THE JOURNAL relating to medical education and medical licensure, but unfortunately prospective medical students seldom read medical journals. In 1910, therefore, the Council began to issue leaflets prepared especially for prospective medical students, and in 1914 a more elaborate pamphlet entitled "Choice of a Medical School" [1] was published containing special instructions for the student and showing the essential entrance requirements, the tuition fees charged, the classification of all medical schools, and whether or not they were recognized by state licensing boards. For a series of years these pamphlets were sent to the principals of high schools, to the presidents of universities, to superintendents of public instruction and, on request, to many individuals, in the effort to have the information called to the attention of prospective students. Many thousands of these pamphlets also were circulated by the deans of state university medical schools. Altogether, more than 50,000 have been distributed. At the present time, therefore, the student who enters a medical college without knowing its classification and its standing before state boards is a rare exception.

REST PERIODS AND PHYSICAL EFFICIENCY

The needs of mankind which arose in every field of activity as an immediate outcome of the World War served to promote the gospel of efficiency at a time when many persons were revolting against the current tendency of measuring human welfare so largely in terms of maximal production. Hence much attention has been devoted of late to the investigation of varied aspects of this subject, notably in the direction of industrial efficiency. Aside from its economic or social relations, however, it has also a purely scientific interest of a sort that attaches to problems of the function of the muscular and nervous systems. Physical efficiency in man is concerned with the physiologic problem of fatigue. Rest is a recognized essential not only for ultimate recuperation but also for satisfactory performance. Hence the important question arises as to how much rest is required and when it should be instituted. The heart carries on its large burden of work successfully by a rapid alternation of contraction and relaxation. Other muscular activities in the body usually lack this rhythmic character and find their cessation at longer intervals. It has been stated recently that when physical labor is very severe in character, an increase in efficiency can be brought about by interrupting the work at rather short intervals with spells of rest. If this is done, many of our procedures in the industrial world might advantageously be modified. Wallrich and Dawson [1] of the University of Wisconsin have come to the conclusion, in a study of the relation of the severity of exertion to the effect of spells of rest on production, that the nature of the work done is the decisive factor. When the exercise is severe, efficiency is increased by periods of rest; with light work, no such gain results. Practice and physical condition or training seem to alter the "neutral" point at which frequent rest periods just begin to show an advantage; hence the obvious desirability of adjusting tasks not only to the proper individual but also to his physical condition or stage of fitness. The same truth presumably applies to patients for whom exercise is to be planned in periods of convalescence.

1. The material for the latest issue of this pamphlet is contained in this issue of THE JOURNAL on pages 540-546.

1. Wallrich, Lucy A., and Dawson, P. M.: The Effect of Short Spells of Rest on Physical Efficiency as Measured by a Bicycle Ergometer, Am. J. Physiol. **56**: 460 (July) 1921.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Hospital for Colored Patients.—Fifteen licensed, graduate physicians of Los Angeles have purchased a site and propose to erect a hospital where colored patients, colored physicians and colored pupil nurses will be welcome.

Appointments for Leland Stanford Medical School.—The following appointments have been made at the Leland Stanford Junior University Medical School, San Francisco: Dr. Paul John Hanzlik, professor of pharmacology, formerly associate professor of pharmacology at Western Reserve University Medical School, Cleveland; Floyd de Eds, instructor in pharmacology; Dr. Robert Reid Newell, instructor in medicine (radiology), formerly assistant in medicine at the University of California Medical School, and Dr. Adelaide Brown, lecturer on child hygiene.

Food Research Institute.—The organization of a food research institute, made possible by the appropriation of a large sum of money by the Carnegie Corporation, is announced as a new department in graduate education at Leland Stanford Junior University. In addition to the research work, lecture courses will be given to the graduate students. Actual work will start in September. Dr. Alonzo E. Taylor, who recently resigned from the faculty of the University of Pennsylvania, will have supervision over the department of consumption. Dr. Carl L. Alsberg, who resigned, July 15, from the U. S. Bureau of Chemistry, will have charge of the production and distribution department, and Dr. John S. Davis, professor of economics, Harvard University, the banking and transportation problems. Food budgets and nutrition diets will be issued and distributed throughout the country, and every effort will be made to teach the American people to live economically.

COLORADO

Personal.—Dr. Philip Work, Pueblo, found a burglar in his office, August 5. Dr. Work captured the burglar and took him in his automobile to the office of the sheriff, where the prisoner confessed that his partner was at work in Dr. Work's home; a deputy captured the second burglar. Dr. Work is the son of Dr. Hubert Work.

DISTRICT OF COLUMBIA

Personal.—Dr. Michael E. Gardner, recently appointed chief of the contagious disease service of the health department of the District of Columbia, has submitted his resignation to the district commissioners. It was accepted. Dr. Gardner served only for a few weeks.

Legislation to Sell Old Naval Hospital.—Representative Butler of Pennsylvania has introduced a bill in Congress authorizing the Secretary of War to dispose of the old Naval Hospital located in the District of Columbia either by sale or other means. The buildings and grounds are situated at Ninth and Pennsylvania Avenue. They have not been used for a number of years by the Navy Department. Efforts have been made for some time to have the property converted into a public library.

GEORGIA

Personal.—Surgeon George A. Wheeler, U. S. Public Health Service, has been ordered to Royston, for the purpose of investigating a reported outbreak of pellagra.

ILLINOIS

Chicago

Hospital News.—Surgeon Leon M. Wilbor, reserve, U. S. Public Health Service, has been placed in supervisory charge of both the Marine Hospital and the Jackson Park Hospital, Chicago, until such time as the transfer of patients in these institutions has been effected.

Health Exhibits at Pageant of Progress.—At the Pageant of Progress held in Chicago, August 1 to 14, exhibits of health activities were conducted by the Chicago Health Department, Illinois State Health Department, American Social Hygiene Association and the United States Public Health Service. There were also exhibits of methods of educating the blind and the deaf.

INDIANA

Physician's License Revoked.—It is reported that the Indiana State Board of Medical Registration and Examination, July 14, revoked the license of Dr. Albert A. Hill of Indianapolis. Dr. Hill had been found guilty of causing the death of a patient by performing an illegal operation.

MARYLAND

Personal.—Dr. Wade H. Frost, former surgeon in the U. S. Public Health Service, has been appointed head of the department of epidemiology and public health administration in the School of Hygiene and Public Health of the Johns Hopkins University.

Report of Health Board.—The state department of health has completed a report regarding the reorganization of the state government as it relates to the state board of health. This report will be used by the medical committee appointed by the governor to study the department. There are 100 employees in the department, which operates under an appropriation of $240,000.

MASSACHUSETTS

Physician Stabbed by Patient.—It is reported that Dr. Nathan H. Garrick, Boston, was recently stabbed in his right arm by a patient who is said to be suffering from nervous trouble.

Addition to Tufts Faculty.—President Cousens of Tufts Medical School, Boston, has announced the appointment of Dr. Fred Wilbur Thyng as professor of anatomy, and Dr. Jesse Leroy Conel as assistant professor.

Personal.—Dr. Cornelius J. McGillicuddy, Boston, has been appointed by the mayor as temporary physician at the Wayfarer's Lodge.——Governor Cox has reappointed Dr. George M. Kline, Beverly, as director of the department of mental diseases, and Dr. Winsor M. Tyler, Lexington, associate medical examiner of the fourth Middlesex district, to succeed Dr. McCarthy, deceased.——Dr. Thomas Cuddy, assistant resident physician at the Long Island Hospital, Boston, has been made resident physician, to succeed Dr. Albert B. Murphy, who recently resigned to become a member of the staff of St. Mary's Hospital, Rochester, Minn.

MICHIGAN

Industrial Adjustment Center.—An institution to house, employ and manage subnormal persons who are too irresponsible to care for themselves, and not mentally deficient enough to send to asylums, is planned for Detroit. Dr. David R. Clark, psychiatrist of Receiving Hospital, who conceived the idea, will have charge of the experiment, which will be called the Industrial Adjustment Center.

NEW JERSEY

Personal.—Dr. Duncan W. Blake, Sr., and Dr. Duncan W. Blake, Jr., were elected medical inspectors of the Gloucester schools.

NEW YORK

New York City

Personal.—Dr. Julius Lilienfeld, professor of physics at the University of Leipzig, has arrived in New York, where he has recently given a demonstration of his new roentgen-ray tube before the New York Roentgen Ray Society. Experiments are being carried on with the new tube at Bellevue under the direction of Dr. Isaac Seth Hirsch, director of the roentgen-ray department of Bellevue and allied hospitals.——Dr. George Gray Ward, Jr., sailed for Europe, July 26, to be gone two months.——Dr. Frederick E. Strozzi, Buffalo, has had conferred on him by the king of Italy the grade of Cavaliere of the Order of the Crown of Italy for conspicuous services during the war.

Resolution Relative to Habit-Forming Drugs.—At a meeting of the board of health, July 25, a resolution was adopted declaring as dangerous to the public health and a menace to the public welfare, any unauthorized possession, sale, distribution, prescribing, administering or dispensing of cocain or opium, or any of their derivatives, or cannabis indica, cannabis sativa, or any of their derivatives, and making such acts unlawful. Certain trades and professions are authorized to dispense these drugs on condition of compliance with all provisions of the Harrison Narcotic Law. The same regulations were made regarding hypodermic syringes or other instruments adaptable for the use of these drugs. The provision does not apply to common carriers or warehouse men, or their employees, engaged in lawful transportation, or storage of such drugs, to public officials or their employees, who are engaged in the performance of their official duties. The resolution makes provision also for the commitment of any addict, on voluntary application, and a discharge or return for further action by the court, when certified by a medical officer or the head of an institution caring for drug addicts. The violation of any of the provisions will constitute a misdemeanor.

PENNSYLVANIA

Hospital News.—The department of pediatrics, St. Margaret's Memorial Hospital, Pittsburgh, recently opened the new wing, which will accommodate thirty-five children. The department is in charge of Dr. Percival J. Eaton. This hospital has also reorganized the department of roentgenology, and installed modern equipment. Dr. Homer Grimm has been made chief roentgenologist.

Lehigh Valley Medical Association.—The forty-first annual meeting of the Lehigh Valley Medical Association was held, July 28, at Delaware Water Gap, under the presidency of Dr. Samuel P. Mengel, Wilkes-Barre. The following officers have been elected for the ensuing year: Dr. Ambrose C. Herman, Lansdale, president; Dr. Alex Armstrong, White Haven, secretary; Dr. Roger P. Batchlor, Palmerton, assistant secretary, and Dr. David H. Keller, Bangor, treasurer.

Dr. Baldy Named to Welfare Post.—Governor Sproul has appointed Dr. John M. Baldy, as commissioner of welfare under authority of the new law which was passed at the last session of the legislature. The law creates a department of welfare under the state government to take over the powers and duties of the old state board of public charities, the lunacy commission, the prison labor board and other related activities. Dr. Baldy has been president of the state board of medical education and licensure since its creation in 1911, and has had much to do with the raising of the standard of medical practice in Pennsylvania and in the upbuilding of the hospital system in the state. Dr. Irvin D. Metzger, Pittsburgh, has been elected chairman of the state bureau of medical education and licensure to succeed Dr. Baldy.

Philadelphia

Personal.—Dr. Neva R. Deardorff, former head of the bureau of municipal research, has been appointed to the board of trustees of the White-Williams Foundation.

Gifts for Phipps Institute.—The Henry Phipps Institute of the University of Pennsylvania has received a grant of

$25,000 a year from the Carnegie Corporation, and $25,000 for two years from the university trustees. The conditions which must be met that advantage may be taken of the Carnegie grant are, first, the grant itself be expended for research, and second, there shall be previously expended for research not less than $50,000 a year, derived from other sources, in any year in which this grant is claimed.

SOUTH DAKOTA

Sioux Valley Medical Meeting.—The annual meeting of the Sioux Valley Medical Association was held, July 20-21, at Sioux Falls, under the presidency of Dr. Ernest A. Jenkinson, Sioux City. Dr. Robert E. Farr, Minneapolis, gave an address on the use of local anesthesia, illustrated by moving pictures.

TENNESSEE

Cheerfield Farm.—The public were invited to the formal opening exercises at Cheerfield Farm for undernourished children or those with tuberculous tendencies. The farm is situated near Raleigh, and is prepared to take care of fifty children. When active symptoms of tuberculosis are detected the patient will be sent to the sanatorium at Oaksville.

TEXAS

Health Appropriation Cut.—The appropriation asked by the state board of health has been cut $361,840—almost one half—by the joint appropriation committee. Among the items eliminated were the appropriation to continue the fight against bubonic plague, provision for rural sanitation and the bureau of public health education.

CANADA

Personal.—Gen. George Stirling Ryerson, M.D., Toronto, is spending the summer at Niagara-on-the-Lake, Ontario. ——Dr. George D. Porter, Toronto, has been appointed lecturer on public health in the University of Toronto.—— Prof. J. W. Bridges, Ohio State University, Columbus, has been appointed assistant professor of psychology at the University of Toronto.

United States Doctors at Summer Association Meeting in New Ontario.—The annual meeting of District No. 9 of the Ontario Medical Association, known as New Ontario, was held, August 3, on board the steamer *Armoorlon*, the Magnetawan River, which district is the summer home of many notable medical men in Canada and the United States. On board the meeting was presided over by Dr. Edgar Brandon, North Bay, Ont. The following contributed papers: Dr. William E. Gallie, Toronto; Drs. Howard A. Kelly, Thomas Cullen, Charles L. Summers, Baltimore; Charles D. Parfitt, Gravenhurst, Ont.; Abraham Flexner, LL.D., New York, and Chancellor Kirkland, Vanderbilt University, Nashville, Tenn.

GENERAL

Reunion of Medical Officers.—The second annual reunion of the Eighty-Ninth Division Medical Officers will be held in Kansas City, Mo., Oct. 28, 1921. It is planned to have this meeting at the same time the Veterans of the World War hold their annual session.

National Association of Federal Medical Officers.—The Medical Reserve Officers stationed at U. S. Public Health Service Hospital No. 41 have recently formed an organization to be known as the "National Association of Federal Medical Officers," the object of which is "to promote and improve the care and treatment of disabled ex-service men; to promote better cooperation among its members; to maintain the highest possible standards of medical efficiency, and to advance the economic welfare of its members." Major John P. Wheeler, New Haven, Conn., was elected president, and Captain George S. Spence, Vineland, N. J., secretary. A local chapter was also formed to be known as the New Haven Chapter, and a business meeting of the association held, July 22. It was voted to forward to all public health stations a copy of the proceedings of the association, together with the constitution and a circular letter urging immediate organization of local chapters.

Warning.—Dr. O. P. Walker, Memphis, Tenn., writes that a male nurse giving the name of Clare D. Brooks, weight about 215 pounds, about 5 feet 7 inches in height, reddish complexion, smooth shaven, dark hair and brown eyes, wearing glasses, while employed in his office as an assistant, collected funds from patients and did not turn them over to the bookkeeper, and also passed a number of checks, signing the name of one of the members of the firm to a check which he cashed. Investigation shows, according to Dr. Walker, that the nurse has had a police record in Detroit and Kansas City and has been recently heard of in St. Louis, where it has been reported that he again endeavored to pass a worthless check.

Sweet Bill to President Harding.—The Sweet bill for the creation of a veteran's bureau has been adopted by both houses of Congress and signed by President Harding. In the conference between the Senate and the House several final changes were made, the most important being to put the bureau under the direct jurisdiction of the President instead of making it a part of the Treasury Department. The measure combines the Bureau of War Risk Insurance, the agencies of the U. S. Public Health Service that have heretofore had charge of the hospitalization, care and treatment of disabled ex-service men, and the federal Board of Vocational Training into an independent organization. It also makes more liberal terms under which compensation may be granted. President Harding has appointed Col. C. R. Forbes, the present head of the War Risk Bureau, as the new head of the Veterans' Bureau.

Senate Committee to Investigate Hospitals.—The Senate committee headed by Senator Sutherland conducting an investigation into the care and treatment of ex-service men has announced its intention of making inspections of government hospitals before submitting its first report to the Senate. The committee will visit these hospitals unannounced and without advance notice. Patients in these institutions will be questioned by members of the committee regarding treatment accorded them by hospital officials and regarding conditions which they are compelled to bear. The committee is continuing its public hearings in the Senate office building. Col. C. R. Forbes, director of the Bureau of War Risk Insurance, was a witness last week and testified concerning conditions at the Johnson City, Tenn., Old Soldiers' Home, where 850 disabled veterans are patients. He declared that agents of the bureau had conducted a secret investigation and discovered that the inmates were living under the most astounding conditions of vice, corruption and immorality. Unless Congress took immediate action, he asserted, the deaths at the Johnson City institution would be higher than occurred among troops during the war. M. P. McInereny, an investigator for the War Risk Bureau who lived in the home for a week as a patient, testified to having bought morphin, moonshine and extract of ginger containing 95 per cent. alcohol. He stated that the grounds were overrun with immoral women. The witness testified that many patients carried revolvers, and there was no discipline. Senator Walsh, a member of the committee, demanded that the evidence be submitted to the attorney-general for prosecution.

Conference on Pellagra.—A conference to prevent the spread and recurrence of pellagra, attended by Surgeon-General Cumming of the U. S. Public Health Service, health officials from twelve Southern states, representatives of the American Red Cross and officials of the Department of Agriculture, met in Washington, D. C., this week. Discussion of the situation developed the general opinion that "there will be an increase of pellagra this year in localities in certain states where the disease has been epidemic." But, on the other hand, "the data show that the number of cases and deaths during 1921 will still be less than the annual average during the period of 1914 to 1921." Denial was made that there is a "condition approaching a famine or plague in the South," and the conference held that statements "erroneous and misleading" had been made to the public. In the resolutions that were adopted, emphasis was placed on the necessity that "federal health agencies, especially farm and home demonstration agencies of the state agricultural schools, carry into the rural homes the practical necessity for a better balanced diet, which should always include eggs, milk or milk products and vegetables." Further, that "encouragement should be given to efforts for the establishment of health departments in all counties or other units of government which will permit well trained health officers to carry leadership which will insure healthier and more productive lives." Those attending the conference were: State health officials: Dr. W. S. Leathers, Mississippi; Dr. J. P. Folan, Oklahoma; Dr. W. B. Kesting, Florida; Dr. W. F. Cogswell, Montana; Dr. Olin West, Tennessee; Dr. C. W. Garrison, Arkansas; Dr. A. T. McCormick, Kentucky; Dr. James A. Hayne, South Carolina; Dr. S. W. Welch, Alabama; Dr. Oscar Dowling, Louisiana; Dr. Ennion Williams, Virginia, and Dr. W. S. Rankin, North Carolina. Representing American Red Cross: Col. J. S. Joy, Washington, D. C.; Dr.

E. A. Peterson, Washington, D. C.; George H. Jones, director, southwestern division; Robert E. Bondy, director, southwestern division, and Harry L. Hopkins, manager, southern division. U. S. Department of Agriculture: C. O. Bannon, O. B. Martin and J. A. Evans. U. S. Public Health Service: Surg.-Gen. Hugh S. Cumming; Asst. Surg.-Gen. Allan J. McLaughlin, in charge of states relations; Asst. Surg.-Gen. J. W. Schereschewsky, in charge of scientific research; Asst. Surg.-Gen. B. A. Warren, in charge of sanitary reports and statistics; Dr. Joseph Goldberger, pellagra expert, and Edgar Sydensticker, statistician.

LATIN AMERICA

Personal.—Dr. J. Avilés and Dr. A. R. Laugier were the representatives of the Porto Rico Medical Association at the Boston session of the American Medical Association, of which it is a component part.——The Silva Araujo prize was recently awarded by the National Academy of Medicine at Kio de Janeiro to Dr. Belmiro Valverde for his work on "Leprosy in Brazil."

The Exodus from Colombia to Panama.—The *Repertorio de Medicina* of Bogota publishes an address by Dr. E. Montaña at a meeting of the surgical society, protesting against the way in which the sick in Colombia flock to the hospitals in the Canal Zone, and seeking to explain the reasons for this exodus to Panama and the remedy therefor. He said that the physicians and surgeons of Colombia have practically all taken supplementary training in their special fields in the Old World or in North America, but if this exodus continues they will soon have no clients but the indigent, stating that the records of the Ancon Hospital at Panama show that 62 per cent. of its pay patients are from Colombia. It is the fashion to go to Panama for treatment, and people talk of the wonderful operations done there, but he shows how the same kind of operations are done at home in Colombia and with just as much success. He urges the profession in Colombia to do more teamwork. By combining resources it will be possible to secure trained nurses like the famous ones of North America, more comfort in the hospitals and roentgen-ray equipment for differential diagnosis.

FOREIGN

Next International Congress of Urology to Be Held at Rome.—The second meeting of the International Urological Society, which is the name adopted since the war for the reorganized International Urologic Association, is to convene at Rome in 1924. The subjects appointed for discussion are glycosuria; vaccine therapy in urinary surgery, exclusive of gonococcus infection, and the remote results of surgery for calculi in the kidney. Professor Alessandri of Rome is to preside.

Shanghai Medical Society.—The society, recently formed, consists of most of the resident medical practitioners of Shanghai including all nationalities. The object will be the promotion of medicine, surgery and collective sciences in China by means of lectures and clinics. The members will also have the privilege of using the extensive medical and surgical library of St. Luke's Hospital. Dr. S. A. Rawson is president, and Dr. Hugh Lovet Cummins, secretary-treasurer.

Council on Pharmacy and Chemistry for Italy.—The recent merger of the medical school of the University of Pavia with the medical institutions of Milan including the institutes for graduate research, the great hospital, etc., has already been chronicled. It is now proposed to organize in connection with the whole a pharmacotherapeutic institute with purposes much the same as the Council on Pharmacy and Chemistry of the American Medical Association. Prof. P. Piccinini in his appeal on the subject in the *Avenire Sanitario* urges to model the institute on the one recently organized in the Netherlands, as more modest in its scope than the American council. It aims to investigate pharmaceuticals and inform the medical students and others, and combat nostrums.

Appropriation Asked for Further Research on Friedmann's Remedy.—In the 1921 budget of the German government department for science and art, one specification is for 800,000 marks to continue the study of the Friedmann remedy for tuberculosis. Already several hundred thousand marks of government appropriations have been spent on the committee conducting the research. The *Deutsche medizinische Wochenschrift* remarks that it would be better to devote the money to maintaining the sanatoriums which are closing their doors for lack of funds. The social insurance authorities have had to close the children's sanatorium at Lichtenberg and dismiss the personnel, and the full utilization of the great sanatorium at Beelitz is threatened. Our exchange states that $10,000 has been received from Chicago friends to apply to the support of the children's asylum maintained by the Nationalstiftung, and its name has been changed to Chicago-Kinderheim der Nationalstiftung.

Deaths in Other Countries

Dr. **Evaristo García,** a prominent physician, professor of medicine and statesman of Colombia, one of the founders of the National Academy of Medicine, president of the first national medical congress, member of the state and national legislature and author of numerous works on leprosy, tropical diseases, malaria, alcoholism, etc. He was appointed to the chair of medicine soon after his graduation in 1870. ——Dr. **Nicasio Fernández** of Madrid, killed in a railroad accident.——Dr. **O. Schmiedeberg,** formerly professor of pharmacology at the University of Strasbourg, aged 83. He is said to have been the first to introduce and systematize experimental pharmacology, and his Materia Medica is now in its seventh edition and has been translated into several languages. He was born in Russia, and had been elected honorary member of a number of foreign scientific societies. ——Dr. **R. Jahn,** chief health officer of Vienna.——Dr. **Rámirez Santibañez** of Mayaguez, Porto Rico.——Dr. **P. Rusca** of Rome.——Dr. **L. Simarro,** a psychiatrist, neurologist and histologist of Madrid, aged 69.——Dr. **L. Becker** of Berlin, an authority and writer on accident and sickness insurance matters.—Dr. **W. Beckh,** dermatologist of Nürnberg, aged 85.

Government Services

Purchase of Hospitals Authorized

Secretary Mellon of the Treasury Department has authorized the purchase of sites and buildings of the U. S. Public Health Service hospitals at Augusta, Ga., and Oteen, N. C., for the care of disabled soldiers. An expenditure of $814,000 at Augusta and $700,000 at Oteen is also authorized. The institution at Augusta will be developed into a soldier hospital of 500 beds and include five sixty-bed cottages, one twenty-five-bed tuberculosis cottage, one pavilion for disturbed patients, one kitchen and dining room, two cottages for nurses, one cottage for male attendants, and one power plant. At Oteen, the improvements provide for a fire-proof infirmary building with 200 beds for disabled soldiers. This sanatorium is now providing treatment for nearly 1,000 patients.

Public Health Service Inaugurates Nurses' Training School

Surgeon-General Hugh Cumming of the U. S. Public Health Service has inaugurated a training school for nurses. Consideration of the establishment of such a school has been under way for almost a year. The training will be given in selected government hospitals and the first course of instruction will be open Sept. 1, 1921, at Fort McHenry in Baltimore and at Fox Hills, Staten Island, N. Y. These hospitals provide for experience in surgical nursing, including orthopedic, eye, nose and throat; medical, including communicable, nervous and mental diseases; roentgen ray and laboratory technic; experience in diseases of children and public health nursing. Gynecology and obstetrics will be provided in the second and third years of the three-year course through affiliation with civilian hospitals. On entrance a credit of nine months, or approximately an academic year, will be given to graduates of the accredited colleges. Candidates should make application in person or writing to the Surgeon-General, U. S. Public Health Service, Washington, D. C.

Public Health Service Exhibits at Pageant

A feature of the Pageant of Progress held in Chicago was the exhibit of the United States Public Health Service arranged by Dr. Charles Bolduan. This included a series of twenty-four plates depicting the history of medical science and the progress of the health movement from the earliest times as well as demonstrations of modern methods of diagnosis, microscopic slides showing the various types of common pathogenic bacteria and charts showing the methods of conducting health exhibits.

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 18, 1921.

The National Health

The annual report of the chief medical officer of the ministry of health for 1920 shows the steady improvement in the public health during the last decade, which is one of the most important social events of our time increasing the expectation of life. There was a rise in the birth rate last year which is conspicuous and interesting. The birth rate per thousand was:

1901-1910	27.2	1918	17.7
1916	20.9	1919	18.5
1917	17.8	1920	25.4

These figures show that we are recovering from the fall in the birth rate produced by the war. Still more encouraging is the fall in the death rate. The death rate per thousand was:

1901-1910	15.4	1918	17.6
1916	14.4	1919	13.8
1917	14.4	1920	12.4

The principal causes of death in their order were organic heart disease, diseases of the nervous system, cancer, bronchitis, pneumonia and tuberculosis:

Disease	Proportion of Deaths Per Thousand Deaths From All Causes
Organic heart disease	105
Diseases of the nervous system and special senses	102
Cancer	94
Bronchitis	82
Pneumonia	80
Tuberculosis of lung (phthisis)	72

INFANT MORTALITY DECLINE

The infant mortality is falling very rapidly. The mortality among children under 1 year, per thousand births, was:

1901-1910	128	1918	97
1916	91	1919	89
1917	96	1920	80

Most of the deaths still occur before the end of the fourth week of life. It is a significant fact that, whereas the general infant mortality rate is 80, that for illegitimate children is 155. This may be ascribed in large measure to lack of maternal care, and shows how great a part British motherhood has played in reducing the child death rate. Unhappily, the number of puerperal deaths has increased. This mortality has scarcely declined since 1894, and last year no fewer than 4,144 women died in childbirth and another 1,086 from conditions associated with it; 1,730 of the 4,144 died from puerperal fever. Epidemic encephalitis increased last year, the figures being: 1919, 541 cases notified; 1920, 890 cases notified. Possibly, however, diagnosis of the condition is improving. Research work is being carried out for its elucidation. There were sharp epidemics of scarlet fever and diphtheria—epidemics to some extent expected—but the case mortality was very small and is declining. Tuberculosis is still the most immediately fatal of the notifiable diseases, being responsible for 8.8 per cent. of the total deaths in England and Wales. Tuberculosis, however, and especially consumption, is declining fast. Notifications show a steady decline since 1912, and even in 1920 there was a fall of 4,500 on 1919. The difference between the figures for pulmonary tuberculosis in 1920, compared with 1917, shows practically a reduction of more than one sixth. The total number of cases notified is by far the lowest recorded since compulsory notification came into force. A substantial fall has also taken place in the number of deaths registered. The practice of the ministry of health in regard to venereal disease is based largely on the findings of the royal commission of 1916. But important new steps have been taken. In 1920 there were made 69,000 microscopic examinations and 138,000 Wassermann tests. Venereal disease schemes of treatment have been instituted in 142 counties and county boroughs. The number of treatment centers now established is 190 with approximately 800 weekly sessions. Several "ablution" centers have been opened for an experimental period. Thirteen hostels have also been approved for the admission of women and girls. Special provision is now made in twenty-two medical schools for teaching the diagnosis, pathology and treatment of venereal disease. The effect of communal action against these diseases is difficult to measure, but in the fourth year of the scheme (1) there was a total number of new cases treated in clinics (including nonvenereal cases) of 103,000; the total number of attendances was 1,488,000; (2) the rapid rise of "new" cases in 1918 and 1919 did not continue; (3) the total attendance has increased greatly, the clinics being more appreciated as time passes.

MATERNITY AND CHILD WELFARE

The fall in infant mortality is held to be due not so much to any one factor as to general enlightenment and the coordination of ameliorative agencies on behalf of the mother. With the increase of the number of infant welfare centers from 340 in 1914 to 1,937 in 1920, the infant mortality rate has fallen from 105 to 80 per thousand during the same years. About 50,000 mothers bring their babies to the centers during a week; the number of mothers going regularly to centers is probably not less than 150,000.

Drunkenness

The annual licensing statistics, issued in a blue book on the operation of the laws relating to the sale of intoxicating drinks in England and Wales, show that in 1920 there were reductions in the numbers of saloons, but that the number of registered clubs is greater than ever. Convictions for drunkenness were more than half as numerous again as in 1919, but are still only just over half the total of the "record" year, 1913. As in 1919, the increase of clubs appears to be in some degree due to the revival of clubs which had ceased to exist during the war, and in a greater degree to the institution of new clubs to meet the desire of large numbers of men to maintain the associations they had formed during service with the forces. The total number of convictions for drunkenness in England and Wales in 1920 was 95,763, as compared with 57,948 for 1919—an increase of 65.26 per cent. This represents a continuance, with somewhat less vigor, of the reaction shown in 1919 from the notable decrease in convictions for drunkenness which began in the latter months of 1914 and persisted through the war years. The reaction began in the middle of 1918, and in 1919 increased month by month until December, which was the high-water mark. During 1920 a slight tendency to diminution was observable toward the end of the year, and for each of the areas—except Wales—the figures for December, 1920, are less than those for December, 1919. The total for 1920 is more than three times as great as the lowest total reached during the war, in 1918, and for the first time since 1915 the year's figures exceed one half of the highest total recorded since 1907—188,877 in 1913.

Awards for Medical Discovery

As reported before, this subject has been discussed from time to time. A conjoint committee of the British Science Guild and the British Medical Association was formed to call the attention of the government to the subject and had

suggested that a system of small pensions, somewhat on the lines of the civil list pensions, ought to be established in order to compensate physicians and others for work of great advantage to the public without being remunerative to themselves. Last year a deputation of the bodies mentioned waited on the government, which received their suggestions with sympathy but felt that there would be some difficulty in selecting particular candidates for the proposed pensions. The committee then wrote to the prime minister asking him to indicate or to establish some route by which awards might be obtained in deserving cases, and suggesting that the powers of the royal commission on awards to inventors might be enlarged so as to include medical and sanitary discoveries and inventions. He still has the matter under consideration. In a letter to the *Times*, Sir Ronald Ross calls attention to a case which illustrates the extreme disadvantages under which physicians now labor in the field of discovery and invention. Before or during the war a physician made valuable additions to methods of diagnosis by the roentgen ray, especially the localization of bullets in wounds. He therefore appealed to the royal commission for leave to apply to it for some reward, the commission having been expressly appointed for considering such claims. He was, however, refused permission on the ground that the chairman had "such a high esteem for the noble ideal which the medical profession had adopted for themselves in foregoing personal advantage in much of their work, giving their services free, discountenancing advertisement, and so on, that he was in favor of maintaining this spirit, and altogether against the idea that the royal commission could be persuaded to give an award to a member of the medical profession." Sir Ronald Ross points out that this means that while the inventors of life-destroying devices may be rewarded, those of life-saving devices, and indeed all medical men who improve medical and sanitary practice by scientific investigations or appliances, are to be excluded. There is only this to be said for it: The medical profession rightly objects, in the interests of suffering humanity, to medical discoveries or inventions being kept secret or monopolized by those who make them; but this does not mean that those who have made such discoveries or inventions and who have not kept them secret and have not monopolized them should be deprived of all reimbursement. Just the converse: these are precisely the cases in which the state is justified in making good the losses which conscientious medical men incur by their altruism. It is precisely because physicians do not patent their ideas that the state should endeavor to reward them in other ways.

PARIS

(From Our Regular Correspondent)

July 15, 1921.

Inquiry into Epidemic Encephalitis

On account of the recurrence of epidemic encephalitis, the minister of public health has requested the Academy of Medicine to devise measures to combat this disease and also epidemic hiccup. In order to furnish the academy with the necessary information, the minister has asked the prefect of police to notify him immediately of all cases coming to his knowledge. Consequently, though it is not compulsory to notify the administration of these diseases, the prefect of police has addressed a circular to all physicians in Paris asking them to advise him of all cases, even though mild, that come to their notice. With this object in view, all physicians have been sent question blanks on which to report their information in regard to the evolution of the disease; the presence or absence of similar cases in the home, in the locality, and in the region in which they live, and the relationship of the disease to influenza and to poliomyelitis.

Repression of Fraud in the Sale of Mineral Waters

The sale of so-called artificial mineral waters is beginning to take on the nature of a fraud on the public. As Monsieur Meillère recently stated before the Academy of Medicine, mineral water is a natural product concerning the composition of which we have but very scant knowledge and one that is hard to preserve with all its original qualities. The original water from which the mineral salts are obtained by evaporation can never be reproduced exactly by redissolving such residue, no matter how much care may be taken to perfect the process. Much less can it be truthfully claimed that a synthetic product is identical with the mineral water of which it is an imitation. To sell to the public an artificially mineralized water in place of a natural mineral water constitutes a fraud and should not be tolerated. The same may be said of saline powders sold for the extemporary preparation of artificial mineral waters corresponding to certain types of natural mineral water. In this case, also, the purchaser is cheated as regards the substantial qualities of the product sold him. The Academy of Medicine has so well recognized the dangers to public health that lie in such practices that it now refuses all authorization for the exploitation of salts derived by the evaporation of mineral waters and intended to be ingested in place of the original mineral waters. The sale of these powders under the name of a natural spring, the composition of which they unjustly pretend to represent, cannot but create confusion in the mind of the public. A decree with the view to repressing existing abuses and frauds in the sale of mineral waters is being drawn up.

Election of Foreign Correspondents of the Academy of Medicine

At a recent session, the Academy of Medicine elected, as foreign correspondents, Professor Henderson of Harvard University; Sir Robert Philipp of Edinburgh; Sir Humphry Rolleston of London, and Sir d'Arcy Power, also of London.

MEXICO CITY

(From Our Regular Correspondent)

July 24, 1921.

Academy of Medicine

At recent meetings of this association, there have been discussed, among others, the following subjects:

Dr. E. Cervera reported his experiences with the Wassermann test as regards the frequent presence in human serums of a varied amount of natural antisheep amboceptor. His conclusions are based on a comparative study of 100 cases, in which he was able to bring about the previous absorption of the natural amboceptors by the use of the antihuman hemolytic system proposed by Noguchi.

Dr. Ulises Valdés reported some cases in which he has resorted to a treatment, both simple and efficient, for the relief of febrile puerperal endometritis. The treatment consists in giving small doses of quinin by mouth, about 0.5 gm. each day, and abstaining from washes and any other local treatment aside from simple drainage with an aseptic gauze drain, and above all in keeping the patient in a sitting position instead of lying down as usual. This method, Valdés said, appealed to him when he first became acquainted with it because of its simplicity, and the results have always fulfilled his hopes. The successful outcome might be explained by the antiseptic action of quinin and the excellent drainage of the infected uterus. The sitting position will not permit the retention of septic products, and therefore their absorption will be very limited or cease absolutely.

Dr. J. Monjarás reported that when he visited Tampico to make an inspection according to orders from the head of the public health department, he examined several dead

bodies of plague patients. He found one of them infested by jiggers (*Sarcopsylla penetrans*). Suspecting that there might be some relation between this parasite and the plague infection, he carried out a bacterioscopic examination of the jiggers taken from the body and found *B. pestis* present. Dr. A. Gochicoa assisted him in this research. This finding brings up the question as to whether the presence of the plague bacillus was a mere coincidence or whether the parasite was the vector for the organism as it is the case with other diseases. The problem has a practical bearing, since, should the second possibility be true, there would have to be determined the place where the jiggers get the plague bacillus, and jigger infestation would have to be guarded against as a prophylactic measure against plague.

Second National Congress on Tabardillo

The call for this congress, which will be held under the auspices of the Public Health Department in the city of Mexico, Dec. 25-30, 1922, has already been issued. Besides physicians, other scientists may participate in the meeting, provided they have made studies related to typhus fever. The organizing committee will invite scientific institutions, both national and foreign, to take part in the congress. The official language will be Spanish but, as a courtesy to foreign delegates, papers in both French and English will be admitted. The committee has recommended for discussion several interesting subjects related to the etiology, prophylaxis and therapeutics of tabardillo. Further information may be obtained from the secretary, Dr. Ricardo E. Cicero, calle de las Moras, No. 34, Mexico City.

Transactions of Fifth Medical Congress

The Fifth National Congress, which had been postponed since 1912, was finally held in January, 1918, in the city of Pueblo. The publication of the proceedings, however, was deferred until a few days ago, when at last they were issued in a volume. The National University bore the expenses of publication, and Dr. Alfonso Pruneda, reporter of the congress, did the compiling. Copies of this book may be obtained by addressing the Director of the University, or Dr. Pruneda, 1ª del Alamo, 14.

Marriages

ARTHUR DUDLEY JACKSON, Major, M. C., U. S. Army, Ft. Riley, Kan., to Miss Hermione Walls Hoge of Kansas City, Mo., August 1.

GEORGE OVERTON BASSETT, Ft. Stanton, N. M., to Miss Kathleen G. Crowley of Forrestville, Conn., May 27.

DUDLEY LOUNSBERY ROSSITER, Fort Wayne, Ind., to Miss Mary Ann Hedgcock of Plymouth, Ill., July 28.

CECIL CLARE COPELAND to Miss Della Scott, both of Beaver City, Neb., at North Platte, Neb., in June.

DOUGLAS MACFARLAN, Ardmore, Pa., to Miss Dorothy Campbell of Whitemarsh, Pa., recently.

CECIL GEORGE NEWBECKER, Mill Valley, Calif., to Miss Grace Cahill, San Francisco, in June.

CHARLES HUTCHINSON, Martinsburg, W. Va., to Miss Nancy Reid, Chatham, Va., recently.

WALTER DENT WISE, Baltimore, to Mrs. Hugh McMillan of Colorado Springs, Colo., July 27.

GEORGE H. MISKO, Arcadia, Neb., to Miss Gladys Irene Whitford, Arlington, Neb., June 7.

JAMES G. EBLEN, Lenoir City, Tenn., to Miss Annie Whittle of Whittle Springs, Tenn., July 12.

WILLIAM C. MINNICH to Mrs. Cleo Gregg Fulton, both of Hot Springs, Ark., July 28.

HARRY S. MOORE to Miss Clara Elizabeth Hogue, both of San Francisco, August 4.

HERBERT H. DAVIS to Miss Olga Metz, both of Omaha, June 29.

Deaths

George A. Lung ⊕ Captain, M. C., U. S. Navy, Newport, R. I.; University of Pennsylvania, 1886; died from a gunshot wound, self inflicted, at his summer home, Bristol, R. I., July 26, 1921, aged 59. Captain Lung was serving as medical officer to the members of the Naval War College. He was born in Canandaigua, N. Y., Dec. 21, 1862. After his medical graduation he was appointed assistant surgeon in the Navy, Nov. 3, 1888. In November, 1900, he was promoted to surgeon. He served with Admiral Sampson's squadron in the Spanish American War and was commended for bravery by the Secretary of the Navy for service in Samoa in 1899. In 1900 he served as medical officer with U. S. Marine Detachment in China, and in 1901 in the Canal Zone. During the administration of President Roosevelt he acted as naval officer on the *U. S. S. Mayflower*. Since 1912 he has served at the Naval Home, Philadelphia and during the World War was commander of the U. S. Naval Hospital in Brooklyn. He was president of the Association of Military Surgeons in 1919.

Walter Henry P. Hill, Montreal, Quebec; McGill University, Montreal, 1900; M.R.C.S. (Eng.), L.R.C.P. (London), 1902; formerly on the staff of the Montreal General Hospital; in 1915 went overseas with the McGill (No. 3) General Hospital, major, R. A. M. C., demonstrator of clinical surgery, McGill Faculty of Medicine; and until his death, associate surgeon, Royal Victoria Hospital, Montreal; was found dead in his automobile, July 23, from heart disease, aged 45

James Foster Means ⊕ Claremore, Okla.; Baltimore Medical College, 1892; specialized in ophthalmology; was secretary of the Board of U. S. Examining Surgeons for West Virginia, 1897-1904; took postgraduate courses at the New York Medical College and in Europe, in dermatology and ophthalmology; one of eighteen United States delegates to British Congress on Tuberculosis, in London; Captain in M. C., U. S. Army; died, July 9, from aortitis, aged 55.

William H. Baldwin, Alexandria, La.; Memphis Hospital Medical College, Memphis, 1901; member of the Tennessee State Medical Association, and also of the Louisiana State Medical Society; superintendent of the U. S. Public Health Service Hospital, Camp Stafford, 1919-1921; major, M. C., U. S. Army for four years, discharged, June 12, 1920; died, July 28, at the Baptist Hospital, from appendicitis, aged 50.

David Dandie Brough, Boston; Medical School of Harvard University, Boston, 1893; member of the Massachusetts Medical Society; connected with the Boston Health Department since 1893, and deputy commissioner since 1917; resigned July 26; hanged himself at his home, while suffering from despondency, July 31, aged 55.

Edwin Wilson Moore ⊕ San Diego, Calif; Charity Hospital Medical College, Cleveland, 1869; member of the Medical Society of the State of Pennsylvania; practitioner for nearly half a century; contributor to medical periodicals; died, July 31, at the Memorial Hospital, New York City, from pneumonia, aged 73.

James Monroe Fay, Northampton, Mass.; University of Vermont, Burlington, 1875; member of the Massachusetts Medical Society; elected to state legislature, 1892; died, July 26, at the Cooley Dickinson Hospital, where he had been on the staff for more than twenty years, and was a trustee until his death, aged 74.

Clovis Adams, Jersey City, N. J.; French School of Medicine, Paris; Columbia College, New York City, 1877; served in French army hospital, Franco-Prussian War; on the staffs of the Manhattan Eye, Ear, Nose and Throat Hospital, and the Orthopedic Hospital, New York City, died, July 28.

James T. Gibson, West Newton, Ga.; Georgia Eclectic Medical College, Atlanta, 1881; formerly county commissioner of Newton County, and chairman of the board of trustees of Livingston High School until the time of his death, June 24, aged 63.

Wesley F. Clapp, Fairport, N. Y.; New York Homeopathic Medical College, New York City, 1872; for several years, chairman of the Fairport Board of Education; died, July 15, at the Lee Private Hospital, Rochester, from cerebral hemorrhage, aged 73.

Abraham Jerome Kaiser, Newark, N. J.; Atlantic Medical College, Baltimore, 1909; died, July 8, at the Hahnemann Hospital, New York City, following an operation, aged 41.

⊕ Indicates "Fellow" of the American Medical Association.

Rachael Tatnall Moon, Philadelphia; Woman's Medical College, Philadelphia, 1904; physician in charge at the House of Industry for Women and Children; died, July 24, at the Women's Hospital, Philadelphia, aged 47.

William H. Fahrenbruch, Culbert, Neb.; University of Nebraska College of Medicine, Omaha, 1920; died, July 24, at a local hospital in Lincoln, Neb., from pneumonia, following an illness of two years, aged 25.

George De Forest Smith, Kingston, N. Y.; College of Physicians and Surgeons (Columbia University), New York City, 1876; member of the New York Academy of Medicine; died, July 30, aged 69.

Marshal D. Callane, Flora, Ind.; Medical College of Indiana, Indianapolis, 1902; member of the Indiana State Medical Association; died, July 21, after a four months' illness, aged 50.

Benjamin Franklin French, Tippecanoe City, Ohio; Hahnemann Medical College and Hospital, Philadelphia, 1880; Civil War veteran; died, June 23, at a hotel in Indianapolis, aged 86.

Elizabeth Cohen, New Orleans; Woman's Medical College of Pennsylvania, Philadelphia, 1857; died, May 28, at the Julius Weis Home, from myocarditis, aged 101.

Wallace B. Kelly, Independence, Kan.; New York Homeopathic College, New York City, 1881; member of the Kansas Medical Society, died, July 22, aged 76.

Archibald Campbell, Orrville, Ohio; University of Michigan, 1871; practitioner for nearly half a century; died, June 2, after an illness of two years, aged 76.

Levi Dawson Crawford, Marked Tree, Ark.; Barnes Medical College, St. Louis, 1894; died at Drakesboro, Ky., April 6, from angina pectoris, aged 63.

John P. Houston, Edwardsville, Ala.; Chattanooga (Tenn.) Medical College, 1904; died, July 1, at Heflin, Ala., from cerebral hemorrhage, aged 75.

Chester St. Julien Macbeth, Chicago; Northwestern University, Chicago, 1917; specialized in surgery and roentgenology; died, July 13, aged 35.

Green Munroe Cook, Hazard. Ky. (license, Ky., 1914), years of practice; member of the Kentucky State Medical Association; died, July 15.

William E. Crismore, Fremont, Ohio; Eclectic Medical Institute, Cincinnati, 1895; died suddenly, July 16, from cerebral hemorrhage, aged 49.

Everett Sayles Towne, Burlington, Vt.; University of Vermont, Burlington, 1914; was drowned in Lake Champlain, N. Y., June 18, aged 36.

Will J. Davidson ✠ Parkersburg, W. Va.; Atlanta Medical College, Georgia, 1895; died, July 12, in a local hospital, from blood poisoning.

John W. Patton, Morrilton, Ark.; University of Arkansas, Little Rock, 1889; member of the Arkansas Medical Society; died, May 11, aged 53.

Helen Williston Brown, New York City; Johns Hopkins University, Baltimore, 1911; died in the Sloane Hospital, July 29, aged 38.

Francis J. D'Avignon, Ausable Forks, N. Y.; Louisville Medical College, Louisville, 1874; dropped dead on the street, July 10, aged 70.

William A. Amis, Meeker, Okla.; University of Nashville (Tenn.), 1872; died about June 1, from cancer of the stomach, aged 72.

Thomas H. Pelletier, Van Buren, Me. (license, Maine, act of 1895); served in military hospital, Civil War; died, July 17, aged 78.

Douglas S. Tiffany, Waterloo, Iowa; Chicago Homeopathic Medical College, 1888; died, May 27, from heart disease, aged 60.

James Middleditch, Barneveld, N. Y.; University of Buffalo, N. Y., 1881; died, July 11, from cancer of the liver, aged 66.

Oscar Eskew ✠ Lebanon, Tenn.; University of Tennessee, Nashville, 1897; died, July 1, from tuberculosis, aged 46.

C. V. Dean, Wichita, Kan.; St. Louis Medical College, 1883; died, May 15, from narcotic toxemia, aged 65.

Margaret B. Best ✠ Meadville, Pa.; Trinity Medical College, Toronto, Can., 1899; died, May 26, aged 56.

Louis P. Coates, Altoona, Pa.; University of Pennsylvania, 1885; died, July 6, from chronic myocarditis.

John Haig, Bloomfield, Ind.; Miami Medical College, Cincinnati, 1880; died in July, aged 56.

Correspondence

CHIROPRACTIC IN OHIO

To the Editor:—I am enclosing a letter which I was obliged to address to a physician in Ohio last fall, together with the reply which I received, thinking that perhaps the correspondence might be of interest to readers of THE JOURNAL. Please omit the real names of the persons concerned.

M. M. WICKWARE, M.D., Detroit.
Supreme Physician, Ancient Order of Gleaners.

Dr. ————————,
————————, Ohio.

Dear Doctor:—I have before me for consideration the proofs of the death of Mrs. ————————, who held a benefit certificate in the Gleaner Organization. The medical portion is signed and filled out by one "Doctor" S. B. Yoder, a chiropractic man. Would like to inquire of you whether the state of Ohio allows chiropractors to fill out death certificates? Evidently he was the last attendant upon the deceased and gives the cause of death as follows: "Analysis of spinal column showed complicated diseases. I adjusted for five months and half, which was contributed to her stomach and bowels and kidney which was paralized and overcame her heart & caused death."

As the proofs of death show that you attended the deceased at one time, would be pleased if you will, as one of our regular examiners, give me your opinion as to the cause of death, and inform me as to the standing and limitations of chiropractors in your state.

It seems ridiculous to me that these operators should be allowed to sign death certificates and to inflict themselves upon the public in any other capacity than ordinary "rubbers."

DR. M. M. WICKWARE,
Supreme Medical Examiner.

Dear Doctor:—Your letter to hand and will say in reply that Mrs.—— died from gumma of the brain due to tertiary syphilis. Her blood test was Wassermann ++++.

This is one of the few states that allows chiropractors to sign death certificates.

————————, M.D.

OPPORTUNITIES FOR GRADUATE MEDICAL EDUCATION IN EUROPE

To the Editor:—In England as in other countries having customs different from our own, it is always desirable, especially to hurrying Americans, to know along what lines to proceed, in order to avoid loss both of time and of energy that could have been put to better ends.

So far as London is concerned, since its people speak English, the two special items concerning which Americans who are making their first trip abroad usually wish information are: What and where are the postgraduate facilities in London? What would be an average cost of living in London?

As regards postgraduate work in London, "The Fellowship of Medicine and Post-Graduate Medical Association," which was founded in 1918 under the presidency of the late Sir William Osler, exists for the express purpose of uniting overseas and British schools and students of medicine. This organization has its offices in the building of the Royal Society of Medicine at 1 Wimpole Street, London, W. 1. The building is not far from Oxford Circus, and is almost opposite Old Cavendish Street, where it ends in Henrietta Street. The executive secretary of the organization is Miss M. Willis, who is on duty daily, except Saturday, from 10 to 5. The American University Union in Europe is another London organization, and it offers a cordial invitation to Graduates of Class A American medical schools to register at the office of the society, which is located at 50, Russell Square, W. C. 1, London. It is open from 9:30 to 5:30, except Saturdays, when it closes at 1 p. m. Physicians who contemplate study in England should send twenty cents in American stamps to Miss Willis, with the request that a copy of the Bulletin of the Fellowship of Medicine and Post-Graduate Medical Association be mailed to them. An American physician can receive this bulletin weekly for one year by mailing the minimum membership fee of $2.50 to

Miss Willis, and asking to be placed on the membership roll and mailing list. Members of this fellowship are also invited to avail themselves of the rooms and facilities of the "English Speaking Union" which are located at 1, Charing Cross, overlooking Trafalgar Square, London.

Living expenses need not exceed the cost of similar standards of living in America. I know of one American who has told me he has a pleasant flat and that his expense of living for himself and his wife totals about $75 a month. He states that the markets are not expensive, and if one can find such a flat (some of the secretaries of the schools have lists, just as in America) it is seen that one's living expenses need not be any greater than in America. Of course, London has facilities for any kind of purse.

GEORGE H. KRESS, M.D., Los Angeles.

CHANGES IN EDUCATIONAL METHODS AND LEGISLATION ADVOCATED

To the Editor:—The discrepancies in the standards of the different legalized systems of practice are well known to the regular medical profession, and the time would appear to be ripe for a campaign of popular education and the revision of our state laws and regulations governing the irregular, so-called, schools.

It is axiomatic that a definite level of knowledge of certain basal sciences, more especially anatomy, physiology, physiologic chemistry and pathology, must form an indispensably necessary background of any or all practitioners of the healing art. Without doubt the adoption of a uniform standard by the state equivalent to that of the first class, regular schools of medicine in this country, in the branches before named, would enlighten the student to the extent of enabling him to appreciate the limitations of usefulness as curative agencies of osteopathy and other drugless cults, it being generally conceded that some, at least, of these newer sects and isms have a little virtue behind them.

Unfortunately, the regular profession is largely responsible, through neglect of that valuable measure massage, and certain additional forms of mechanotherapy, for the birth of osteopathy and other mongrels, and the present period of social reconstruction would, as already stated, be an appropriate season in which to bring about a just modification of existing state laws and regulations that control them.

Obviously, the desired goal can only be reached by getting the public back of the movement. To this end, the public must be fully informed of the inadequacy in important particulars of the preparation in irregular schools for the diagnosis and treatment of the many ills to which man is liable, that great deficiencies are to be noted in the advantages offered by them, not only with regard to opportunities for the study of the scientific branches, but also for the study of diseases at the bedside as well as from the laboratory side. It will be seen that the situation demands an organized educational campaign on a country-wide basis, and this could be most effectively carried out by the American Medical Association, with the concerted assistance of other leading national and local medical societies. The mechanism needed could readily be developed by this large and influential body on the basis of state or county units.

In concluding, let me recapitulate my proposals: (*a*) uniformity of training in the vitally important fundamental branches—anatomy, physiology, physiologic chemistry and pathology, for all schools and sects; (*b*) a corresponding revision of existing laws and regulations as affecting the irregular schools of practice with respect to these subjects; (*c*) public education as a preliminary and accompanying step, with a view to crystallizing public sentiment in favor of the two preceding propositions; (*d*) publicity regarding the low standards prevailing in irregular schools as compared with regular schools of medicine, and (*e*) direction of public attention to the limited spheres of usefulness of osteopathy and the other newer sects.

JAMES M. ANDERS, M.D., Philadelphia.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

AUTO-URINE TEST FOR TUBERCULOSIS—INTRADERMAL INJECTION OF URINE

To the Editor:—Please describe the auto-urine test for active tuberculosis.

K. M. LYNCH, M.D., Dallas, Texas.

ANSWER.—This test was first described by H. Wildbolz in the *Correspondenz-Blatt für Schweizer Aerzte* **49**:793 (May 31) 1919. Wildbolz demonstrated that when there is an active process of tuberculosis the urine contains an antigen which, injected by the Mantoux intradermal technic, induces infiltration and redness. This does not occur with urine from healthy persons or in urine from persons with healed tuberculous processes. It never occurs unless the person gives a positive response to injection of 1:10,000 tuberculin, but it seems to occur whether the urine is from the person being tested or not, so long as he has an active tuberculous process anywhere in the body, in glands, peritoneum, lung, bones or elsewhere. Wildbolz evaporates morning urine to 1:10, passes it once or twice through a paper filter impregnated with 2 per cent. phenol (carbolic acid), and then makes three sets of two injections on the arms, the two upper with 1:1,000 tuberculin; 3 or 4 cm. below this, two with 1:10,000 tuberculin, and, the same distance below, two with a minute ambunt of the 1:10 evaporated urine. The response with an active tuberculous process is the same with the urine as with the diluted tuberculin, but the tuberculin response persists unmodified after the process has healed, while the urine response fades out completely. A similar response was never obtained in the nontuberculous, not even in syphilis, influenza, etc., with the single exception that urine containing large amounts of staphylococci induced a reaction, so that the findings are not pathognomonic in certain cases of nephritis. With this exception, this biologic reaction may be depended on to reveal the tuberculous or nontuberculous nature of lesions, and will also disclose when they are healed. If the urine reaction persists after the clinical healing of the known process, there is some other active process elsewhere. The specific nature of the urine reaction is demonstrated still more conclusively by the fact that, after subsidence of the urine reaction, if an injection of 1:1,000 tuberculin is made nearby, the apparently extinct urine reaction flares up anew, the infiltration and redness becoming distinct again.

VITAMINS AND THEIR DISTRIBUTION

To the Editor:—I have noticed of late frequent advertisements extolling the virtue of Fleischmann's yeast as a supplementary food because of its water soluble B content. While it is true that yeast is rich in the supply of this vitamin and that its absence from the diet causes disease—viz., beriberi—the advertisements fail to mention that this disease is exceedingly rare in America and that, as McCollum states, there is seven times as much of this heat-stable, water-soluble vitamin in the average American mixed diet as is needed for health.

HUGH MACDONALD, M.D., Evanston, Ill.

ANSWER.—"The Uses of Yeast" were discussed in this department of THE JOURNAL, Aug. 23, 1919. At that time it was pointed out that while yeast is a rich source of the accessory food factor known as water soluble B, so many common foods also contained this vitamin that there was little likelihood of yeast proving of any therapeutic value on that account. As a matter of fact, there is a vast amount of nonsense promulgated today—usually for commercial purposes—on the subject of accessory food factors. Two years ago a report was published by a committee appointed jointly by the Lister Institute and the Medical Research Committee, detailing briefly "The Present State of Knowledge Concerning Accessory Food Factors (Vitamins)." The findings of this committee are of great interest. At the end of the report a valuable table is given, showing the distribution of the three vitamins in the commoner foodstuffs. In the absence of quantitative data it was impossible for the committee to

do more than indicate the relative values of the foodstuffs as sources of the various vitamins, by the rough method of positive and negative signs. The table, with slight modifications, follows:

Classes of Foodstuff	Fat-Soluble A or Anti-rachitic Factor	Water-Soluble B or Anti-neuritic (Anti-beriberi) Factor	Antiscorbutic Factor
Fats and Oils:			
Butter	+ + +		
Cream	+ +		
Cod-liver oil	+ + +		
Mutton fat	+ +		
Beef fat or suet	+ +		
Peanut oil	+		
Fish oil, whale oil, etc.	+ +		
Margarin prepared from animal fat	Value in proportion to amount of animal fat contained		
Nut butters	+		
Meat, Fish, etc.:			
Lean meat (beef, mutton, etc.)	+	+	+
Liver	+ +	+ +	+
Kidneys	+ +	+	
Heart	+ +	+	
Brain	+	+ +	
Sweetbreads	+	+ +	
Fish, white	.....	very slight, if any	
Fish, fat (salmon, herring, etc.)	+ +	very slight, if any	
Fish, roe	+	+ +	
Canned meats	?	very slight	
Milk, Cheese, etc.:			
Milk, cow's whole, raw	+ +	+	+
Milk, skim, raw	.....	+	+
Milk, dried whole	less than + +	+	less than +
Milk, boiled, whole	undetermined	+	less than +
Milk, condensed, sweetened	+	+	less than +
Cheese, whole milk	+		
Eggs:			
Fresh	+ +	+ + +	?
Dried	+ +	+ + +	?
Cereals, Pulses, etc.:			
Wheat, maize, rice, whole grain	+	+	
Wheat germ	+ +	+ + +	
Wheat, maize, bran	.....	+ +	
Linseed, millet	+ +	+ +	
Dried peas, lentils, etc.	.....	+ +	
Soy beans, haricot beans	+	+ +	
Germinated pulses or cereals	+	+ +	+ +
Vegetables and Fruits:			
Cabbage, fresh (raw)	+ +	+	+ + +
Cabbage, fresh (cooked)	.....	+	+
Cabbage, dried	+	+	very slight
Cabbage, canned	.....	.....	very slight
Swede (rutabaga) raw expressed juice	.....	.....	+ + +
Lettuce	+ +	+	
Spinach (dried)	+ +	+	
Carrots, fresh raw	+	+	+
Carrots, dried	very slight		
Beetroot, raw, expressed juice	.....	.....	less than +
Potatoes, raw	+	+	
Potatoes, cooked	.....	.....	+
Beans, fresh, scarlet runners, raw	.....	.....	+ +
Onions, cooked	.....	.....	+ at least
Lemon juice, fresh	.....	.....	+ + +
Lemon juice, preserved	.....	.....	+ +
Lime juice, fresh	.....	.....	+ +
Lime juice, preserved	.....	.....	very slight
Orange juice, fresh	.....	.....	+ + +
Raspberries	.....	.....	+ +
Apples	.....	.....	+
Bananas	+	+	very slight
Tomatoes (canned)	.....	.....	+ +
Nuts	+	+ +	
Miscellaneous:			
Yeast, dried	.....	+ + +	
Yeast, extract and autolysed	?	+ + +	
Malt extract	.....	+ in some specimens	

None of the three factors were found in:
Lard.
Olive, cottonseed, coconut or linseed oils.
Coco butter.
Hardened fats, animal or vegetable in origin.
Margarin from vegetable fats or lard.
Cheese from skim milk.
Polished rice, white wheaten flour, pure cornflour, etc.
Custard powders, egg substitutes, prepared from cereal products.
Peaflour (kilned).
Meat extract.
Beer.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ALASKA: Juneau, Sept. 6. Sec., Dr. Harry C. De Vighne, Juneau.
MASSACHUSETTS: Boston, Sept. 13-15. Sec., Dr. Walter P. Bowers, 144 State House, Boston.
NEW HAMPSHIRE: Concord, Sept. 9-10. Sec., Dr. Charles Duncan Concord.

Massachusetts March Examination

Dr. Walter P. Bowers, secretary, Massachusetts Board of Registration in Medicine, reports the oral, written and practical examination held at Boston, March 8-10, 1921. The examination covered 13 subjects and included 70 questions. An average of 75 per cent. was required to pass. Of the 47 candidates examined, 18 passed and 27 failed. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Hahnemann Medical College of the Pacific	(1916)	75.2
American Medical Missionary College	(1904)	75
Rush Medical College	(1921)	79.1
Johns Hopkins University	(1901)	79.1
Maryland Medical College	(1910)	75
University of Maryland	(1918)	79.7
Harvard University	(1919)	79.9
Middlesex College of Medicine and Surgery	(1920)	76.8, 82.8
University Medical College of Kansas City	(1900)	75
Columbia University	(1916)	85.3, (1919) 84.3
Jefferson Medical College	(1920)	83.5
University of Helsingfors	(1899)	75
University of Edinburgh	(1915)*	97.1
Medical School of American University of Beirut	(1905)*	76.5, (1918)* 75, (1919)* 78.4
FAILED		
College of Physicians and Surgeons, Los Angeles	(1920)	58
Emory University	(1920)	71.7
University of Maryland	(1919)	72.7
Baltimore Medical College	(1902)	68.7
College of Physicians and Surgeons, Boston	(1908)	65.9, (1920) 57.1, 65.8, 70.5
Middlesex College of Medicine and Surgery	(1918)	59.4, (1920) 55.7, 66, 68.6, 70.7, 71.2, 72.1
Tufts Medical College	(1920)	72.6
Laval University	(1918)	60.7, (1920) 68.9
University of Naples	(1919)*	51.9
University of St. Vladimira	(1904)*	61.1
University of Constantinople	(1915)*	52.5
School of Medicine and Surgery, Lisbon	(1915)*	57.4
Osteopaths		63, 64.5, 66.2, 67.3, 68.7

* Graduation not verified.

Ohio April Examination

Dr. H. M. Platter, secretary, Ohio State Medical Board, reports that 26 candidates were licensed by reciprocity at the meeting held April 5, 1921. The following colleges were represented:

College	Year Grad.	Reciprocity with
LICENSED BY RECIPROCITY		
Georgetown University	(1917)	W. Virginia
George Washington University	(1907)	Dist. Colum.
Howard University	(1908) Pennsylvania, (1915)	Dist. Colum.
State University of Iowa College of Medicine	(1919)	Iowa
State Univ. of Iowa Coll. of Homeopathic Medicine	(1906)	Iowa
Kentucky School of Medicine	(1884)	Indiana
University of Louisville	(1876)	Kentucky
Baltimore Medical College	(1909)	W. Virginia
Johns Hopkins University	(1919, 2)	Maryland
University of Maryland	(1903)	Penna.
University of Michigan Medical School (1915), (1916), (1918), (1920, 4)	Michigan	
University of Michigan Homeopathic Medical School	(1915)	New York
St. Louis University School of Medicine	(1918)	Missouri
Meharry Medical College	(1918) Texas, (1919)	W. Virginia
(1920)	Maryland	
Vanderbilt University	(1906) Alabama, (1910)	Kentucky

Delaware June Examination

Dr. P. S. Downs, secretary, Delaware State Board of Medical Examiners, reports the written and practical examination held at Wilmington, June 21-23, 1921. The examination covered 10 subjects and included 100 questions. An average of 75 per cent. was required to pass. Four candidates were examined, all of whom passed. Two candidates were licensed by reciprocity. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
University of Maryland	(1921)	82.4
Temple University	(1920)	78.3
University of Pennsylvania	(1920)	77.8
Osteopath		77.3

College	Year Grad.	Reciprocity with
LICENSED BY RECIPROCITY		
Syracuse University College of Medicine	(1908)	New York
University of Virginia	(1920)	Virginia

Book Notices

MANIC-DEPRESSIVE INSANITY AND PARANOIA. By Professor Emil Kraepelin. Translated by R. Mary Barclay, M.A., M.B., from the Eighth German Edition of the "Text-Book of Psychiatry," Vols. III and IV. Edited by George M. Robertson, M.D., F.R.C.P., Professor of Psychiatry in the University of Edinburgh. Cloth. Price, $6. Pp. 280. Chicago: Chicago Medical Book Company, 1920.

Kraepelin's approach to the subject is almost purely pictorial. If there has been any advance in the interpretative side of psychiatry, he apparently considers it negligible. It is impossible to read page after page of repetitions of the contents of delusions, pages of percentages in ages, sex, etc., and not be struck by the lack of space devoted to some attempt at understanding the patient. It may be that repetitions such as occur in the chapters on psychic symptoms, manic states and depressive states are necessary; but in the absence of space devoted to some discussion of possible interpretation, it seems like padding. It may be that the text has suffered in translation as, for example, on page 186 a paragraph beginning with the words "weighty reasons" is not preceded by what seem to be weighty reasons. Time after time the occurrence of ideas of sin and persecutions are cited as being coexistent, without a suggestion that there can be any causal relation between the two and without comment as to the origin of the ideas of sin. In fact, on page 13 the author states that "the delusional interpretation is of subsidiary importance." In view of the pictorial nature of the book, it is of interest to observe in a portrait (page 28) great preoccupation or withdrawal from reality which is not mentioned in the text. Is there no relationship between perception, consciousness and memory? There is none hinted at; the different psychic manifestations are handled as if quite independent of one another. Although the manic-depressive predisposition is mentioned as the fundamental state, still the book gives a distinct impression of dealing with a sickness, not of dealing with a personality become sick. The conception of paranoia has gradually grown to be more circumscribed. Is it because cases which can be considered "psychically intact" are becoming more difficult to find? Is the idea of intact psyche in a mental disease something to be thrown aside as paradoxical? The action of emotion, of desire, on perception is too completely proved to be neglected. If the paranoiac is dominated by ideas into which fit his delusions, is his perception not going to be falsified and can he be considered psychically intact? Would not the distinguished author himself be among the first to be offended by the inconsistency of the conception of paranoia? Many of his quotations, such as that on page 222, could scarcely be considered as emanating from one psychically intact. The portion devoted to causes and delimitation is of much greater interest than the rest of the book, but what is condensed into twenty pages seems to be rather overbalanced by the preceding 250 pages.

GLI APPARECCHI ORTOPEDICI. By F. Delitala. Cloth. Pp. 296, with 248 illustrations. Bologna: L. Cappelli, 1921.

This book is interesting and well written. It emphasizes properly the use of celluloid as a material for many varieties of splints, and describes the technic. Sheet celluloid, especially, has been far too little employed in America in the construction of orthopedic apparatus, although celluloid dissolved in acetone has been familiar to us for many years. Vulcanized rubber, which is advocated for some of the arm splints, is undoubtedly useful, but the difficulties in connection with its preparation have interfered with its popularity. In general, the book follows closely the standard practice in those countries where orthopedic work has made a place for itself as a special branch of surgery. The braces for scoliosis are well designed, and will probably be widely copied. An appendix contains a description and specifications for an orthopedic shop. It is somewhat disappointing to find very little reference to prostheses and artificial limbs, especially those designed to be used after kineplastic amputations, but it is probably true that even in Italy, the place of its birth, the kineplastic method has not as yet been sufficiently standardized by the surgeons and the makers of apparatus.

Medicolegal

Town Without Authority to Operate Ambulance and Not Liable for Injuries

(*Ducey v. Inhabitants of Town of Webster* (*Mass.*), 130 *N. E. R.* 53)

The Supreme Judicial Court of Massachusetts, in ordering a judgment to be entered for the defendant in this action brought by the plaintiff to recover damages because, while he was a traveler on a public highway, he was run into and injured by an automobile ambulance owned by the defendant and operated by one of its agents, holds that, as the defendant had no authority to purchase and operate the ambulance for the purposes for which it was used, the defendant could not be held in damages for the negligence of its servants or agents. The court says that the ambulance was purchased and put in charge of the selectmen of the town of Webster by a vote or votes regularly passed in a town meeting, and was used by the town in conveying the inhabitants thereof to hospitals outside the town whenever occasion required, which service was free to residents of Webster. It was also used to carry passengers from surrounding towns, a charge being made for such services. Under the statutes of Massachusetts, a town may erect and maintain a hospital for the reception of persons who require relief during temporary illness. It may establish hospitals within its limits for the treatment of diseases dangerous to public health. It may also contract for the care and treatment by hospitals in the town or in the vicinity thereof of persons who by misfortune or poverty require relief. But no authority is expressly given to towns to operate an ambulance for the general conveyance of the sick and injured who may require hospital treatment; and no such power can be implied, even if the court assume, without deciding, that it may be at times necessary to provide by suitable means for the conveyance of patients to or from a municipal hospital established by the town, or to or from a hospital for the treatment of diseases dangerous to the public health, or for the conveyance to a hospital in a neighboring city or town of poor people who require relief and who because of misfortune are unable to pay; and, also, that it may be a proper charge for which the town can appropriate money. There is no statute in Massachusetts which permits a town to expend the public funds for the purchase and operation of an ambulance for the general use of the inhabitants in case of sickness, when they are able to pay for their conveyance and are not dependent on the public for support. On the record, that was the use to which this ambulance was put. It follows that the operation of the ambulance was beyond the defendant's corporate powers, and was not a necessary charge for which the money of the taxpayers could be appropriated. It is furthermore the established law of Massachusetts that the inhabitants of a town in their corporate capacity are not liable for a tort committed under the supposed authority of an illegal and void vote of the town. Nor, on the record in this case, could the operation of an automobile ambulance be held to be incidental to powers of the town, or sanctioned by long established usage. Neither does the case fall within the recognized rule holding a municipality responsible for injuries when it has undertaken a work under the law, but incidentally and in part for profit.

Society Proceedings

COMING MEETINGS

Amer. Assn. of Obst., Gynec. and Abdom. Surgs., St. Louis, Sept. 20-22.
American Electro-Therapeutic Association, Washington, D. C., Sept. 7-10.
American Roentgen Ray Society, Washington, D. C., Sept. 27-30.
Colorado State Medical Society, Pueblo, Sept. 6-8.
Delaware State Medical Society, Rehoboth, Aug. 16.
Idaho State Medical Association, Twin Falls, Oct. 6-7.
Indiana State Medical Association, Indianapolis, Sept. 28-30.
Kentucky State Medical Association, Louisville, Sept. 27-29.
Minnesota State Medical Association, Duluth, Aug. 24-26.
National Medical Association, Louisville, Ky., Aug. 23-26.
Pennsylvania, Medical Society of the State of, Philadelphia, Oct. 3-6.
Utah State Medical Association, Salt Lake City, Sept. 13-14.
Washington State Medical Association, Seattle, Sept. 2-3.
Wisconsin, State Medical Society of, Milwaukee, Sept. 7-9.
Wyoming State Medical Society, Casper, Sept. 6-8.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Annals of Surgery, New York

July, 1921, **73**, No. 1

*Ruptured Spleens, Spontaneous and Subcutaneous. J. F. Connors, New York.—p. 1.
*Spontaneous Rupture of Malarial Spleen. W. E. Leighton, St. Louis. —p. 13.
*Surgery of Cysts of Spleen. R. H. Fowler, Brooklyn, N. Y.—p. 20.
Technic of Nerve Surgery. K. W. Ney, New York.—p. 37.
*Surgery of Infantile Paralysis. J. T. Rugh, Philadelphia.—p. 61.
*Fracture of Skull in Children. J. J. Moorhead and W. Weller, New York.—p. 72.
*Value of Chlorinated Soda Solution in Treatment of Thoracic Empyema. A. O. Wilensky, New York.—p. 79.
Primary Closure of Ureter and Renal Pelvis After Nephrolithotomy. L. Guerry, Columbia, S. C.—p. 85.
*Case of Uretero-Ureteral Anastomosis. J. D. McEachern, Winnipeg, Manitoba.—p. 92.
*Diverticula of Jejunum. H. N. MacKechnie, Chicago.—p. 96.

Spontaneous and Subcutaneous Spleen Ruptures.—Connors reports the case of a man who complained of pain in the right hypochondriac region which was increased on deep inspiration. He was unable to lie on the right side; was very constipated, having a movement once in three or four days. After severe catharsis bowels would move freely for one day, when the constipation would return. He was nauseated during his attacks of constipation. The roentgenograms showed that he had an obstruction in the region of the splenic flexure. At operation the intestine in the region of the splenic flexure was found to be normal. When the gut at this point was pushed aside, a very large hematoma presented itself, which ruptured as soon as the hand touched it. This proved to be the splenic capsule. The spleen itself was almost bisected longitudinally by a rupture. When the hematoma was cleared away there was no sign of any active hemorrhage. There was no history of trauma. The first pain on the left side occurred the day before his admission to the hospital. Connors believes the rupture occurred that day, and the bleeding was checked by the intracapsular pressure. The man made a good recovery and left the hospital in four weeks in apparently good physical condition. Three months later, he returned with the history that he had had attacks of indigesiton with eructations of gas. At the time of these attacks there is a great deal of pain in the abdomen in the region of the umbilicus. For some time he has been unable to stand in the erect posture on account of a dragging sensation in the region of the mass in the abdomen. This pain was markedly increased at every attempt to change his position. He has a sensation of something swelling inside him, which increased the pain and when able to belch gas was considerably relieved. At operation a large cystic mass was found which seemed to spring from the location of the spleen and was bulging between the stomach and the splenic flexure. It was movable and was free from any adhesions to the surrounding organs. The cyst was packed with iodoform gauze, the wound closed and drained. Connors is certain that this was a pancreatic cyst which was the result of the injury to the pancreas at the time of the operation for splenectomy performed three months previously.

Spontaneous Rupture of Malarial Spleen.—Leighton cites one case, and gives an abstact of cases reported between 1842 and 1921.

Surgery of Cysts of Spleen.—Fowler's studies include ninety cases of nonparasitic cysts of the spleen, representing a variety of types due to various causes classified as true and false, depending on their mode of origin. Two authentic cases of dermoid cysts are recorded in the literature. Sixty cases of nonparasitic cysts have been treated surgically, eleven by puncture, fourteen by incision and drainage, six by excision or partial splenectomy, thirty by splenectomy. The latter is usually the method of choice. The mortality for splenectomy is 3.5 per cent. Echinococcus disease of the spleen represents the one type of parasitic cysts reported in the literature. This disease is rarely a surgical problem of the spleen alone, for in about four fifths of the cases the liver or other organ is involved. There are about one hundred recorded cases up to 1890. The mortality for twenty-three cases subjected to splenectomy up to 1908 is about 17 per cent.

Surgery of Infantile Paralysis.—While the surgery of infantile paralysis has been proved to be one of the most beneficial agents in correcting deformities, and in reconstructing parts for the development and maintenance of function, Rugh states that there are two aids which may never be lost sight of in the quest for success. These two aids are proper and efficient mechanical support until sufficient power has developed to take care of the condition and developmental exercises and training to improve and increase the power which may remain in any of the muscle structures. Coordinate and cooperative efforts are absolutely essential to this work.

Skull Fracture in Children.—A statistical survey of 100 cases was made by J. J. Moorhead and W. Weller. The mortality in this series was 26 per cent., in which 5 per cent. followed vault fracture, and 10 per cent. basal and 11 per cent. combined vault and basal injury; stated in another way, involvement of the base gave a mortality of 21 per cent., four times that of the vault. If associated injuries are excluded, mortality is only 17 per cent. Early death (within forty-eight hours) was due to the head injury or associated injury; thereafter infection in the form of meningitis, often pneumococcic, was the chief factor. Sixteen patients died within twenty-four hours, four within forty-eight hours; this means that over three-fourths (76.7 per cent.) of fatalities occurred in the first two days. Fifty-one per cent. of the quoted cases involved the vault with a mortality of 5 per cent.; 17 per cent. involved the base with a mortality of 10 per cent.; 32 per cent. involved base and vault with a mortality of 11 per cent. By comparison with adults, children have a 25 per cent. better chance for life with an equal grade of skull injury. The number of cases requiring operation is relatively small; in this group 12 per cent. of patients were operated on.

Surgical Solution of Chlorinated Soda Ineffectual in Empyema.—Wilensky expresses the belief that in the cases in which the use of surgical solution of chlorinated soda is satisfactory, a healing similar in all respects would be obtained without the use of this antiseptic solution of the same meticulous care weer exercised in the postoperative management as is necessary according to the precepts of the method.

Case of Uretero-Ureteral Anastomosis.—McEachern has modified Van Hook's technic. He closes the end of the lower segment and invaginates the upper segment in a slit made in the side of the lower segment—a sort of end to side anastomosis.

Diverticula of Jejunum.—Mackechnie reports one case and reviews twenty-five cases from the literature.

California State Journal of Medicine, San Francisco

July, 1921, **19**, No. 7

*Some Aspects of Pernicious Anemia and Its Treatment. S. H. Hurwitz, San Francisco.—p. 275.
Peripheral Nerve Surgery. C. L. Tranter, San Francisco.—p. 280.
*Amebic Abscess of Liver with Pulmonary Sequels. R. Brown, Santa Barbara.—p. 282.
Ureteral Diverticula. N. G. Hale and C. E. von Geldern, Sacramento. —p. 284.
One Hundred Consecutive Perineal Prostatectomies. A. B. Cecil, Los Angeles.—p. 287.
Cases of Fractured Skull Seen in San Francisco Emergency Hospitals. E. Butler, San Francisco.—p. 289.
Surgical Results from Economic Standpoint. G. G. Moseley, San Francisco.—p. 291.
Case of Chronic Dilatation of Duodenum. H. Shoemaker, Los Angeles. —p. 292.
Acute Suppurative Thyroiditis. P. K. Gilman, San Francisco.—p. 294.

Treatment of Pernicious Anemia.—The essential factors of importance in the general care of a patient with pernicious anemia, Hurwitz says, are diet and rest. The latter in particular should be emphasized. Iron and arsenic are of secondary importance. Transfusion of blood is a valuable emergency measure to tide a patient over a severe relapse. It gives remarkable symptomatic relief, and in patients who

are not in a state of the disease refractory to any form of treatment, transfusion helps to bring on a remission. It does not prolong a spontaneous remission, nor does it lengthen the average duration of life of patients suffering from the disease. Removal of the spleen in pernicious anemia may produce an immediately beneficial effect in selected cases by increasing the activity of the bone-marrow, provided the latter does not show evidences of depressed function or exhaustion. Splenectomy may also prolong life in about one-fifth of the patients.

Case of Amebic Abscess of Liver.—Brown's patient had a severe attack of dysentery, which, with remissions, was continuous to death. Following a choking attack, he coughed up a large quantity of pus. Progressive exhaustion and toxemia ensued. Physical examination of the chest and abdomen, supplemented by roentgen-ray findings, revealed what was considered an abscess of the right lung continuous with an abscess of the liver. Dullness reached from the fourth rib above to two finger breadths below the costal margin, where the lower margin of liver was plainly felt. The abdomen was opened. The liver was needled in several directions without aspirating pus. A needle inserted below the angle of the right scapula filled with pus. The rib in that section was resected and a large tube was placed in an abscess of great size. The patient died nine days later. The necropsy showed that the lung tissue in the lower three-fourths of the right lower lobe had been destroyed, and immediately beneath the pleura was a large pulmonary cavity. A second, smaller abscess cavity was found in the left lower lobe. The case presents some interesting features. One, the most important, is the absence of an opening through the diaphragm connecting the liver and lung abscesses. The distribution of the ameba from liver to lung must then have been through the circulation, unless perhaps there was an opening at one time which closed over. The necropsy, however, did not justify such a conclusion. Two, the discovery of an abscess in the left lung, which was overlooked in the diagnosis. This finding could have been made by a more careful study of the roentgenograms, as was determined later.

Johns Hopkins Hospital Bulletin, Baltimore

July, 1921, **32**, No. 365

*Theories of Blood Coagulation. J. Bordet, Brussels, Belgium.—p. 213.
Certain Variations in Form of Human Electrocardiogram. E. P. Carter and F. R. Dieuaide, Baltimore.—p. 219.
*Statistical Note on Epidemic Encephalitis. R. Pearl, Baltimore.—p. 221.
*Therapeutic Significance of Gram Reaction. J. W. Churchman, New York.—p. 225.
Treatment of Placenta Praevia; Anatomic Description of Two Specimens. W. B. Thompson, Baltimore.—p. 228.
Supposed Life-Cycle of Bacteria. H. Berstrand, Stockholm, Sweden.—p. 234.
*Capacity for Phagocytosis Shown by Polymorphonuclear Leukocytes in Dead Animals and After Preservation in Salt Solution. H. B. Cross, Baltimore.—p. 238.
Ingestion of Melanin Pigment Granules by Tissue Cultures. D. T. Smith, Baltimore.—p. 240.

Theories of Blood Coagulation.—Bordet gives a brief résumé of the chief theories which have been held concerning the mechanism underlying the coagulation of the blood.

Statistics on Epidemic Encephalitis.—Pearl shows that in 1920 the case incidence of epidemic encephalitis increased in New York City nearly five-fold over 1919. At the same time the case fatality rate increased from 26 per cent. of the attacked to 37 per cent. of the attacked. It is believed that this increase in case fatality rate is a real phenomenon, and it is certainly statistically significant. The seasonal incidence, as judged by monthly distribution of cases was significantly different in 1920 from what it was in 1919. The peak of mortality in an epidemic outbreak may be expected to occur from 23 to 37 days after the peak of case incidence (morbidity). There is a significantly larger proportion of males among the attacked than there is in the general population, or, put in another way, males are especially susceptible, to a statistically significant degree. Deaths occur among males no more frequently in comparison with females than would be expected from the normal proportions of the two sexes in the population at large. The disease is not more likely to attack either males or females at one age than at another. The age distribution of attacked cases, in other words, does not significantly differ in either sex from the age distribution of the general population. The age distribution of deaths does differ significantly in both sexes from the age distribution of the population. There appears to be a definite tendency for the disease to be more fatal in the higher age groups.

Gram Reaction.—There may exist within a single bacterial strain two types of individuals which, although in every other morphologic, tinctorial and cultural characteristic identical, are quite dissimilar in their reaction toward gentian violet, one growing vigorously and the other not at all on mediums containing this dye. The latter Churchman refers to as a "strain-within-a-strain" variant. The factor which determines the reaction of an organism toward the Gram stain is not necessarily, therefore, the same as the factor which determines its cultural behavior toward gentian violet; and the chemical affinity hypothesis must be abandoned as the sole explanation of the parallelism between Gram and gentian reactions.

Capacity for Phagocytosis in Dead Animals.—Cross asserts that polymorphonuclear leukocytes sometimes take up and digest bacteria within the body after death. In one instance these phagocytes remained alive within the body for eleven days after death and were still capable of energetic phagocytosis. Leukocytes suspended in physiologic sodium chlorid solution, provided a trace of serum be present, may remain alive and manifest active phagocytosis for a considerable time. Marked changes in the temperature of the phagocytes after separation from the body do not destroy and often do not even alter the capacity of the leukocytes for phagocytosis. Polymorphonuclear leukocytes which had retained their functional capacities for three days within the dead body were removed and after being kept several days in a test-tube were still capable of energetically phagocyting bacteria. Phagocytes from the blood and exudates seem to possess about equal tenacity of function. Human leukocytes are capable of sustained independent existence.

Journal of Biological Chemistry, Baltimore

July, 1921, **47**, No. 2

Studies in Vitamin Content: II. Yeast Test as Measure of Vitamin B. W. H. Eddy, H. L. Heft, H. C. Stevenson and R. Johnson, New York.—p. 249.
Apparatus Used in Determining Respiratory Exchange in Man: I. Adaptation of French Gas Mask for Use in Respiratory Work. C. V. Bailey, New York.—p. 277.
Id. II. Sampling Bottle for Gas Analysis. C. V. Bailey, New York.—p. 281.
*Digestibility of Proteins in Vitro: II. Relative Digestibility of Various Preparations of Proteins from Chinese and Georgia Velvet Beans. H. C. Waterman and D. B. Jones, Washington, D. C.—p. 285.
Metabolism of Nitrobenzaldehydes and Nitrophenylacetaldehyde. C. P. Sherwin and W. A. Hynes, New York.—p. 297.
*VIII. Fat-Soluble Vitamin Content of Peas in Relation to Their Pigmentation. H. Steenbock, M. T. Sell and P. W. Boutwell, Madison, Wis.—p. 303.
Determination of Cresol by Phenol Reagent of Folin and Denis. R. M. Chapin, Washington, D. C.—p. 309.
*Effect of Hydrochloric Acid Ingestion on Composition of Urine in Man. R. L. Stehle and A. C. McCarty, Philadelphia.—p. 315.
*Distribution of Calcium and Phosphoric Acid in Blood of Normal Children. M. R. Jones and L. L. Nye, San Francisco.—p. 321.
VII. Autolysis of Brain. C. A. Gibson, F. Umbreit and H. C. Bradley, Madison, Wis.—p. 333.
Catalase Reaction. S. Morgulis, Omaha.—p. 341.
Relation of Migration of Ions Between Cells and Plasma to Transport of Carbon Dioxid. E. A. Doisy and E. P. Eaton, St. Louis.—p. 337.
*Experimental Rickets in Rats: II. Failure of Rats to Develop Rickets on Diet Deficient in Vitamin A. A. F. Hess, G. F. McCann and A. M. Pappenheimer, New York.—p. 395.
Methods of Extracting and Concentrationg Vitamins A, B and C, Together with an Apparatus for Reducing Milk, Fruit Juices and Other Fluids to Powder Without Destruction of Vitamins. J. F. McClendon, Minneapolis.—p. 411.
*Hemato-Respiratory Functions. XII. Respiration and Blood Alkali During Carbon Monoxid Asphyxia. H. W. Haggard and Y. Henderson, New Haven, Conn.—p. 421.
Antiketogenesis. I. An In Vitor Analogy. P. A. Shaffer, St. Louis.—p. 433.
Id. II. Ketogenic Antiketogenic Balance in Man. P. A. Shaffer, St. Louis.—p. 449.

Relative Digestibility of Various Proteins.—Estimations made by Waterman and Jones of the comparative digestibility in vitro by the method of Waterman and Jones of six preparations of the proteins of the Chinese and Georgia

velvet beans indicate: (1) That partial indigestibility is the limiting factor in the failure of raw dialyzed Chinese velvet bean protein to promote growth, and that the normal growth secured with the protein prepared by coagulation from either bean is probably to be attributed to an increase in digestibility brought about by the boiling incident to the preparation of the latter material; and (2) that cooking under the conditions described renders the dialyzed protein from either seed as digestible as the coagulated product, and that probably, therefore, these cooked dialyzed proteins will support growth as well as do the coagulated proteins. The double disadvantage of toxicity and nonassimilable protein content amply explains the behavior of the raw ground bean, while the cooked meal probably still contained dihydroxphenylalanine. The experiments also support the contention that the results of such estimations run parallel with the results of growth experiments, in as far as differences in the digestibility of the proteins are concerned.

Pigmentation and Fat-Soluble Vitamin of Peas.—In ripe peas, out of six samples investigated by Steenbock, Sell and Boutwell; those of a green color, also carrying considerable yellow pigment, were far richer in their fat-soluble vitamin content than yellow peas which contained much less yellow pigment.

Effect of Hydrochloric Acid Ingestion on Urine.—Data are presented by Stehle and McCarty which show that the ingestion of hydrochloric acid causes an increased excretion of potassium, sodium, ammonia, phosphoric acid, and hydrogen ions.

Blood Content of Calcium and Phosphoric Acid in Normal Child.—The alkali reserve of plasma and the distribution of calcium and the various compounds of phosphoric acid in the blood were studied by Jones and Nye in thirty-four normal children whose ages ranged from 4 weeks to 14 years. It appears that the blood corpuscles are richer in all types of phosphoric acid compounds than plasma. The amount of unknown phosphoric acid in plasma is negligible, if any, while in corpuscles it averages approximately 70 per cent. of the total. In general, the values for boys averaged slightly higher than those for girls. The lipoid phosphoric acid content of corpuscles averaged 17.7 per cent. higher in boys than in girls, while the plasma value in boys was 16.6 per cent. higher than that in girls. The inorganic phosphoric acid content of corpuscles showed the greatest percentage variation of all the phosphorus compounds of the blood. The average calcium content of corpuscles was found to be slightly less than that of the plasma, the values in mg. per 100 c.c. being as follows: whole blood, 9.4 mg.; corpuscles, 8.7 mg.; plasma, 10 mg. A relation between the calcium and phosphoric acid contents of the blood is not apparent. The carbon dioxid combining power of the plasma averaged 51.8 per cent. by volume in thirty-two children. No relation between the alkali reserve and the concentration of calcium and phosphoric acid in the blood can be established.

Experimental Rickets in Rats.—Young rats receiving a diet complete except for a lack of the fat-soluble vitamin invariably failed to grow and generally developed keratitis. The keratitis developed less frequently when the ration included orange juice. If this diet is continued for a period of months the animals die, either of inanition or, more often, of some intercurrent infection. The skeletons of such rats show no gross changes whatsoever. Microscopic examination of the bones of twenty-two rats on a ration of this character presented definite signs of a lack of active osteogenesis, but in no instance lesions resembling rickets. In view of these results and their confromity with our previous experience in regard to infantile rickets, Hess, McCann and Pappenheimer are of the opinion that this vitamin cannot be regarded as the antirachitic vitamin, and that, if the diet is otherwise adequate, its deficiency does not bring about rickets.

Respiration and Blood Alkali in Carbon Monoxid Asphyxia.—Carbon monoxid asphyxia, Haggard and Henderson state, induces, not acidosis, but alkalosis. The lowering of blood alkali is due to the acapnial, not the acidotic, process. The anoxemia induces excessive breathing (up to 300 per cent. or more), and the decrease of blood alkali is an attempt at compensation. The rate of oxygen consumption is scarcely, if at all, decreased until death is imminent, but the respiratory quotient may be more than doubled. After section of the vagi, on the contrary, anoxemia due to carbon monoxid causes no overbreathing, and no distinct lowering of blood alkali, even up to death. This fact, appears to be a decisive demonstration that oxygen deficiency itself does not directly cause in the tissues and blood an increased production of organic acids.

Journal of Orthopedic Surgery, Lincoln, Neb.

July, 1921, **3**, No. 7

Supply of Artificial Limbs to War Amputees in England. E. M. Little, London.—p. 307.
*Musculature of Foot, and Its Treatment by Electricity. G. M. Levick, London.—p. 317.
*Static Deformities As Factor in Production of So-Called Hypertrophic Arthritis. R. Patek, San Francisco.—p. 324.
Operative Treatment of Scoliosis. R. Whitman, New York.—p. 330.

Electrical Treatment of Foot Musculature.—Little describes a method of electrical treatment of the foot which is recommended as a preliminary to voluntary exercise, as inseparable from the satisfactory treatment of flat foot. Often it is extremely difficult or impossible to redevelop the small muscles by voluntary exercise alone. This applies especially to those cases that have been repostured by surgical methods, so that they are suddenly relaxed after a long period of overstretching with its accompanying atony.

Hypertrophic Arthritis Not Due to Static Strain.—The percentage of cases with hypertrophic arthritis in which static strain, Patek says, is also present is 11 per cent. But this is practically the same as the percentage seen in all cases coming to orthopedic clinics. Therefore hypertrophic arthritis is not due to static strain.

Journal of Parasitology, Urbana, Ill.

June, 1921, **7**, No. 4

Cytamoeba Bacterifera in Red Blood Cells of Frog. R. W. Hegner, Baltimore.—p. 157.
Two New Monostomes from Asia. E. O. Harrah.—p. 162.
Some Protozoa Parasitic in Fresh-Water Fishes of New York.—R. Kudo.—p. 166.
Gregarines. M. W. Kamm.—p. 175.
Occurrence of Moniliformis Sp. in Rats in Texas. A. C. Chandler. —p. 179.
*Case of Urethral Myiasis. N. Leon.—p. 184.

Case of Urethral Myiasis.—In the case cited by Leon, a student urinated eleven worms which were recognized as normal larvae of *Musca domestica*, about 6 mm. long.

Philippine Journal of Science, Manila

March, 1921, **18**, No. 3

Tropical Geology and Engineering. W. D. Smith.—p. 221.
Philippine Termites. I. S. F. Light.—p. 243.
New Records and Species of Psyllidae from the Philippine Islands, with Descriptions of Some Preadult Stages and Habits. L. B. Uichanco.—p. 259.
New Philippine Myrtaceae. E. D. Merrill.—p. 289.
Descriptions of New Philippine Wasps of Subfamily Pseninae. S. A. Rohwer.—p. 309.

Public Health Journal, Toronto

June, 1921, **12**, No. 6

Consultative Council on Medical and Allied Services. Interim Report on Future Provision of Medical and Allied Services. J. H. Holbrook. —p. 241.
*Schick Reaction in Control of Diphtheria. B. Hannah.—p. 250.
Report of Committee on Rural Communities, Nursing and Social. F. C. Middleton.—p. 254.

Schick Reaction in Control of Diphtheria.—In the Hospital for Sick Children, Toronto, over 2,000 children have had this test performed on them. The statistics correspond very closely to those of Schick, Park, Zingher and various other workers along this line. It is interesting to note the increase in susceptibility of children up to 3 years of age. Following these years, there comes a gradual increase in immunity up to 15 years of age, when it is found that from 10 to 15 per cent. of adults are susceptible to diphtheria. The percentage rate on the prevalence and mortality of diphtheria is greatest between the ages of 1 and 5 years. Under 3 months 15 per cent. were positive; from 3 to 6 months, 30 per cent.; from 6 months to 1 year, 60 per cent.; from 1 to 2 years, 70 per cent.; from 2 to 3 years, 60 per cent.; from 3 to 5 years, 40 per cent.; from 5 to 10 years, 30 per cent.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Radiology and Electrotherapy, London

June, 1921, **26**, No. 1

Preliminary Report of Roentgen Ray and Radium Protection Committee. H. Rolleston.—p. 5.
*Heart in Relation to Habitus and New Method of Estimating Morphologic Changes. I. S. Hirsch.—p. 10.
*Treatment of Exophthalmic Goiter. Herraman-Johnson.—p. 20.
Purity of Barium Sulphate for Roentgen Ray Work. R. V. Stanford. —p. 25.
Robert Boyle Lecture: "Electrons and Ether Waves." W. Bragg.—p. 25.

New Method of Estimating Morphologic Changes in Heart.—Hirsch is of the opinion that an estimation of the relative size of the heart chambers can be obtained with a fair degree of accuracy by the determination of the convexity of the curve which constitutes the profile of the chamber. By actual measurement it has been found that the value of the curves varies with the habitus.

Treatment of Exophthalmic Goiter.—Hernaman-Johnson advises careful individual study of each case and small, frequent doses of the roentgen rays, at any rate, at the beginning of a course of treatment. Roentgen-ray treatment in exophthalmic goiter is in no sense an alternative, much less a rival to surgery. It should be regarded as, in principle, a *via media* between unsuccessful medical treatment and operation. In the worst kind of chronic cases, roentgen rays have no place other than to make the patient a little more fit to stand operation. It cannot fail to be of advantage to the surgeon if even a temporary symptomatic improvement can be obtained. The question as to when to advise operation is not affected by their use—except in so far as their early employment in general will tend greatly to reduce the number of cases in which operation need be considered. Finally, the postoperative application of electricity to the remaining portion of the gland would diminish the by no means negligible risk of recurrence.

British Medical Journal, London

June 18, 1921, **1**, No. 3155

Radium Therapy in Uterine Cancer. A. E. H. Pinch.—p. 881.
*Treatment of Acute Pyogenic Infection of Knee-Joint. A. H. Southam. —p. 884.
Results of Ninety-Eight Cases of Nerve Suture. P. G. Dane.—p. 885.
Five Cases of Rat-Bite Fever: Two Cases Treated Successfully by Novarsenobillon. F. W. Burton-Fanning.—p. 886.
Treatment of Cutaneous Anthrax. W. H. Ogilvie and A. W. Hall.—p. 889.
Cryptogenetic Pneumococcal Septicemia. J. Lumsden.—p. 890.
Herpes and Varicella. G. E. Elkington.—p. 890.
Case of Myoclonic Epidemic Encephalitis. E. J. Bradley.—p. 891.
Action of Quinin on Pregnant and Nonpregnant Uterus in Tropics. W. Fisher.—p. 892.

Removal of Pus in Knee-Joint.—Southam questions the advisability of starting immediate movement of a joint infected by streptococci in a patient who is already in an acutely toxic condition. He recommends a method which has yielded good results in these cases. Operation should be carried out immediately when pathologic examination of the fluid withdrawn from the joint shows that pus cells and pyogenic organisms are present. Under general anesthesia the knee-joint is opened by two lateral incisions on either side of the patella. These extend from the head of the tibia to the upper limit of the subcrureal pouch. The joint is then thoroughly irrigated with hot saline solution, by means of a Higginson's syringe. Every corner of the joint is explored with the nozzle of the syringe and the knee is flexed and extended to ensure thorough lavage. The irrigation should be continued for ten minutes. The synovial cavity is then dried with lint swabs soaked in ether and held in artery forceps. When this has been completed a small quantity of bipp is applied systematically to the articular surfaces and synovial membrane lining the joint. No sutures are used, the lateral incisions being left open for drainage. About a dozen turns of broad gauze are then wrapped round the joint, plenty of wool and a firm bandage being applied over this. A strapping extension is fixed to the leg and the limb placed in a Thomas splint, with the knee slightly flexed. The patient is then returned to bed and a light weight applied to the extension. The dressing is not changed till the fourteenth day, when a fresh one is applied, a little bipp being at the same time rubbed over the lateral incisions. The acute symptoms have usually completely subsided by this time; the splint is removed and the paitent encouraged to move the joint. Massage accompanied by active and passive movements is carried out, and the patient should start walking, when the conditions permit, as early as possible. The dressing is changed about every seven days or as required.

July 16, 1921, **1**, No. 3159

*Malignant Granuloma of Nose. R. Woods.—p. 65.
Infective External Hydrocephalus. C. E. Reynolds.—p. 66.
*Treatment of Asthma by Autogenous Streptococcal Vaccines. L. Rogers. —p. 71.
Transfixion and Impalement Injuries. W. F. Brook.—p. 71.
Physical Basis of Social Inefficiency. J. A. Berry.—p. 72.
*Plea for More Frequent Use of Cesarean Section, with Description of New Operation. A. Jones.—p. 75.
Acute Dilatation of Stomach. C. J. Lewis.—p. 76.
Rat-Bite Fever. C. Randolph.—p. 76.

Malignant Granuloma of Nose.—Two cases are cited by Woods. One patient was a man aged 68. The bridge of the nose was sunken just below the nasal bones. The region of the right lacrymal sac was swollen, and a fistula below the internal canthus discharged a watery fluid on to the cheek. Both sides of the nose were filled with fetid crusts, the cartilaginous septum was gone, some of the soft tissues were deficient, and the walls of the nose in a condition of ulceration. The patient was well nourished, appetite good, no glands were enlarged, and the disease was strictly a local one. Syphilis had nothing to do with the complaint. The fetor was quite peculiar; the crusts were glutinous, and adhered tightly to the forceps used for their removal. Arsphenamin was administered intravenously, mercury and potassium iodid were prescribed, but without the slightest obvious effect on the disease. Examination showed granulation tissue to be the dominant feature, but in one place at least it had developed into something very like a sarcoma. Two years later the disease began to infiltrate the soft palate and back of the nose. In June of that year a necrotic aera began to develop in the right side of the soft palate, and toward the end of July had perforated the palate. Deafness from Eustachian obstruction was very marked and as all attempts at catheterization failed, relief had to be given by myringotomy, which had to be repeated whenever the wound in the membrane healed. Some awkwardness in swallowing resulted from the perforation in the palate. The patient's condition became steadily worse. He died four and a half years after the onset of the disease. The case was as puzzling to the pathologists as to the clinicians. It seemed as if a wave of granulation tissue advanced irregularly into the healthy parts, breaking down behind as it advanced in front, so that there was never any great depth of pathologic growth present. The term "malignant granuloma" was suggested. The second patient was also a man aged 67. Radium therapy apparently effected a cure in this case.

Vaccine Therapy of Asthma.—The method used successfully by Rogers consists simply in making cultures from the sputum, preferably that obtained during or soon after an attack, subculturing a number of colonies of streptococci, including any short chain pneumococci, so as to include a number of strains, and making up a vaccine of the strength of 100 millions in 1 c.c., which can be conveniently put up in one of Wright's small rubber-capped bottles. The initial dose is .25 to .5 c.c., and as soon as little or no reaction ensues it is rapidly worked up to 1.0 c.c. weekly, and after several such doses to 1.5 to 2.0 c.c., the larger doses being given at intervals of ten days. If any marked reaction or temporary increase of the symptoms occurs the dose should be decreased to one-half and cautiously increased again when no reaction follows an injection. The treatment usually has to be continued for two or three months and sometimes longer, several injections being given definite improvement is observed to obtain more lasting results. There has been no selection of cases. In 15 per cent. of the cases the treatment failed to give material relief of a lasting nature. In 32.5 per cent. great relief was afforded, but it was either not permanent or it was incomplete. In 52.5 per cent. the

patients remained well when last heard of from one-half to four years after the treatment.

Improvement on Cesarean Section.—An operation has been devised by Jones with a view to leaving a scar which will stand the strain of future pregnancy. It is based on the fact that there are three layers of uterine muscle; the outer layer with its muscle fibers running transversely, the middle, which contains the vessels, with its fibers running longitudinally, transversely and obliquely, with no regular arrangement, and the inner, arranged as two hollow cones with their bases joining at the middle of the body of the uterus, and their apices surrounding the orifices of the fallopian tubes. In the nonpregnant uterus these layers are difficult to differentiate surgically. In the pregnant uterus, on the other hand, the outer and middle layers are easily differentiated. Jones has taken advantage of this to preform what might be described as a form of gridiron incision. The abdomen is opened in the middle line, and a large strip of gauze wrung out of warm saline is packed between the uterus and the anterior abdominal wall in order to form a dam completely round the incision. The external layer of uterine muscle is now incised transversely, the incision being just below the center of the body in front and two inches above Bandl's ring. To start the incision Jones makes a small V exactly in the middle and about one-eighth inch into the muscle. This V facilitates accurate apposition in stitching later. A pair of straight, blunt-pointed scissors are inserted into this and passed transversely under the superficial layer of muscle, first to one side and then to the other. The superficial layer is then incised along this tract. It is necessary to carry this incision the full distance across the front of the uterus. The superficial layer is then peeled from the middle layer upward towards the fundus. The middle and inner layers are incised longitudinally, and the line of incision selected which seems most clear of blood vessels. This is usually, but not always, the middle line. The child and placenta are delivered, the assistant grasping the uterus firmly to control hemorrhage. The uterus is turned inside out and its interior inspected. Jones' experience with this operation is that the bleeding is distinctly less than with the ordinary incision.

International Journal of Public Health, Geneva, Switzerland

July-August, 1921, **2**, No. 4

Education of Health Officers. G. C. Whipple.—p. 337.
On the Ravages of Congenital Syphilis and Its Prevention. S. Hata. —p. 354.
Health Propaganda in Great Britain. N. Burnett.—p. 360.
Child Welfare Programs. W. O. Pitt.—p. 365.
Treatment of Tuberculosis. R. Burnand.—p. 375.
Public Health Program of Jugo-Slavia. A. Stampar.—p. 384.

Lancet, London

July 16, 1921, **2**, No. 5107

Objective Study of Neurosis. F. L. Golla.—p. 115.
Etiology of Skin Diseases. A. Whitfield.—p. 122.
*Mortality of Premature Infants. T. W. Eden.—p. 127.
*New Method of Exposing Supraclavicular and Infraclavicular Regions. N. A. Dobrovolskaya.—p. 129.
Cases of Acute Hemorrhagic Pancreatitis. A. T. Compton and F. Heber. —p. 130.
*Acute Pancreatitis, Followed by Development of Pancreatic Cyst; Recovery. R. B. Carslaw.—p. 132.

Causes of Mortality of Premature Infants.—Eden asserts that not much information is available from the reports as to the cause of the heavy mortality among the premature infants. From the mortality tables it would appear that no other cause of death than "prematurity" was found in 78 per cent. of the cases. It is not stated in how many cases necropsy was made, and the probability is that in the great majority the diagnosis of the cause of death was clinical only. It is fairly safe to assume that the predominant factor in death from "prematurity" is malnutrition, i. e., failure of the infant to digest or to assimilate the food given. The fatal suceptibility of premature infants to infections of all kinds must not be overlooked; it is due to the fact that their tissues have not yet elaborated a defense against bacterial invasion, and are therefore incapable of "resistance." Breast-fed babies do receive, with the milk of the first fourteen days, immunity bodies, which are, no doubt, serviceable for defensive purposes. Bottle-fed premature infants are without defense of any kind, and, of course, fall an easy prey to infection. While in the lying-in hospitals they are fairly free from risk of infection, except that of seasonal catarrh, and the probability is that infections play but a small part in their mortality during the period under consideration.

New Method of Exposing Clavicular Regions.—A method, worked out by Dobrovolskaya on the cadaver for reaching the subclavian vessels, has been tried on patients and found to be satisfactory. The direction of the incision is as follows: It starts in the middle of the neck, between the two heads of the sternoleidomastoid muscle, runs down to the sternoclavicular joint, which it surrounds in semicircle, and proceeds along the lower border of the clavicle, where it is carried right down to the bone. The periosteum of the inferior and posterior surfaces of the clavicle is to be carefully separated with the raspatory, and the sternal end of the clavicle disarticulated. Care must be taken not to injure the large vessels lying behind these structures. Thus loosened, the sternal end of the collar-bone, with the skin flap still attached to it, is retracted upwards by means of a strong hook or a strip of gauze. The whole region of the subclavian vessels, anonyma included, and the brachial plexus becomes easily accessible.

Acute Pancreatitis Followed by Pancreatic Cyst.—Carslaw's patient was a woman, aged 27. She suddenly developed severe pain in the upper abdomen and back, this being repeated a tirregular intervals during the next five weeks. A tender mass, about the size of a hen's egg, was discovered in the left hypochondrium; and two days later a marked increase in pain, accompanied by almost incessant vomiting. Within twelve hours of admission the general condition became much worse. Vomiting continuous; slight cyanosis; abdomen rapidly becoming greatly distended. The tender mass now filled epigastric and both hypochondriac regions. Abdomen having been opened in middle line, pancreas was found to be enormously enlarged, stomach and transverse colon being displayed downward. The pancreatic enlargement, which was covered by the gastrothepatic omentum, was solid, uniform, yellowish in color, and involved the whole gland. There was marked edema of the peripancreatic tissues, and, in the vicinity of the tail, fat necrosis (confirmed by histologic examination) was present. The general peritoneal cavity contained some free fluid, which was not, however, blood-stained. Four weeks after the operation there was a recurrence of vomiting, and within the next week a painless swelling appeared which soon filled the epigastric and left hypochondriac regions. An estimate of the fat in the stools at this time showed a slight degree of pancreatic insufficiency. The abdomen was again opened. The swelling was found to be a large cyst of the tail of the pancreas, about the size of a child's head. Two months after the second operation the cavity had become completely obliterated, and the patient had since then been perfectly well.

Medical Journal of Australia, Sidney

June 11, 1921, **1**, No. 24

Spinal Analgesa in Urinary Surgery. R. J. Silverton.—p. 475.
Local Anesthesia. H. R. G. Poate.—p. 479.
Some Modern Methods of General Anesthesia. M. C. Lidwill.—p. 482.
Observations on Blood Conditions in Acute Pneumonia. H. F. Maudsley.—p. 484.

June 18, 1921, **1**, No. 25

Some Experiences in Gastric Surgery. A. M. Cudmore.—p. 495.
Treatment of Bacillary Dysentery. R. R. Stawell.—p. 496.
Spinal Analgesia in Urinary Surgery. R. J. Silverton.—p. 497.
Sarcoma of Stomach. A. A. Lendon.—p. 501.
Case of Embolism of Cerebellar Arteries. R. H. Marten.—p. 502.

June 25, 1921, **1**, No. 26

Recent Advances in Medicine. S. F. McDonald.—p. 515.
Advances in Radiology. A. T. Nisbet.—p. 518.
Srangulated Obturator Hernia. R. A. Stirling.—p. 519.

Tropical Medicine and Hygiene, London

July 1, 1921, **24**, No. 13

Undulant Fever. P. W. Bassett-Smith.—p. 173.
Apparatus for Taking Blood-Culture, Giving Subcutaneous or Intravenous Injection, and Collecting Antitoxin. J. G. Willmore.—p. 176.
Typhus. S. B. Wolbach, J. L. Tood and F. Palfrey.—p. 183.
Importance of Microscopic Examination of Human Milk. L. Gershenfeld.—p. 185.

Bulletin de l'Académie de Médecine, Paris

June 28, 1921, **85**, No. 26

*Subacute and Transient Ataxia. G. Guillain.—p. 732.
*Paraffined Starch in Treatment of Diarrhea. E. Doumer.—p. 741.
Vaccine Therapy of Epidemic Bronchitis. E. Sacquépée.—p. 743.

Curable Form of Ataxia in Tabes.—Guillain refers to a subacute ataxia developing in the course of a few hours, without any muscular paralysis, but otherwise closely resembling classic ataxia of long standing. It appears usually as the first sign of abortive tabes, and is distinguished further by the fact that it yields to treatment in the course of a few weeks although the tabes persists. His study of the subject is based on three cases which he describes. The incoordination had all the features of true tabetic ataxia, and all the three patients recovered their normal gait completely in a few weeks, under repose, mercury and iodid. No arsenicals were given. The onset had followed an exceptional physical strain in each case.

Paraffined Starch in Treatment of Diarrhea.—Doumer theorizes that the failure of lactic ferments given in treatment of abnormal intestinal fermentations is often due to the lack of a favorable medium for development of these ferments at the proper place. He supplies this favorable medium in starch, and to insure that the starch reaches the proper point intact, he coats the grains of starch with paraffin. This proved effectual in controlling diarrhea in adults, and he now reports similar success in sixty-four cases in children during a severe epidemic of diarrhea at Lille and one in Southern France. A heaping dessertspoonful of the paraffin starch in the twenty-four hours answered the purpose in each case, in three days on an average.

Bulletin Médical, Paris

June 11, 1921, **35**, No. 24

Clinical Aspects of Cholesterin. P. Gastinel and P. Jacob.—p. 483.
Electroselenium Treatment of Gastric Cancer. Blumenthal-Jacquet.—p. 492.

July 2, 1921, **35**, No. 27

Early Diagnosis of Cancer. J. L. Roux-Berger.—p. 553.

Bulletins de la Société Médicale des Hôpitaux, Paris

June 17, 1921, **45**, No. 21

*Syphilis of Calf Muscles. A. Lemierre and R. J. Weissenbach.—p. 896.
*Syphilitic Melanodermia. Crouzon and R. de Brun.—p. 905.
*Teratoma in Infant's Kidney. G. Variot and F. Cailliau.—p. 907.
*Syphilitic Myositis. Laederich and Tassin.—p. 911.
*Vaccine Therapy in Septicemia. P. Merklen, P. P. Lévy and C. Malet.—p. 914.
*Protein Therapy in Pneumonia. M. Renaud.—p. 919.
*Adjuvant Causes of Malaria. F. Regnault.—p. 927.
Peripheral Venous Tension. M. Villaret et al.—p. 929.
Oscillometric Determination of the Blood Pressure. G. Billard and E. Merle.—p. 933.

Gummatous Tumors in Calf.—In one of the two cases reported the syphilitic myositis had developed in the secondary period of syphilis. In the other young woman, the gummatous tumors in both calves were tardy manifestations of the disease, untreated in both cases.

Syphilitic Melanodermia.—The pigmentation developed early in pregnancy in a tuberculous young woman.

Sarcoma of Kidney in Infant.—The adenolymphosarcoma was found in the left kidney removed from an eight months male infant. It seemed to be of teratoma nature.

Syphilitic Myositis.—In this case both sternocleidomastoid muscles were symmetrically involved in the gummatous myositis in the woman of 40. There was also a process of periosteitis in the sternum.

Septicemia Arrested by Vaccine.—In the case reported by Merklen and his co-workers, bacteriologic examination of the blood was constantly negative in the woman of 36 although the fever had kept between 102.2 and 104 F. with other signs of grave septicemia for thirty days. She was then given a subcutaneous injection of a polyvalent vaccine (staphylococci, streptococci and pneumococci), and the condition began to improve at once. Complete recovery followed. Four injections of the vaccine were given. The response was so prompt and so decided, the only plausible explanation is the assumption of an anaphylactic shock of the colloidoclasis type. The case is thus a fortunate example of parenteral protein therapy applied at the right moment. Colloidal metals had been injected early in the disease, and antipneumococcus serum from the ninth to the twelfth day, but there was no reaction to these. The vaccine had been used as a last resort when the patient seemed already lost.

Treatment of Pneumonia.—Renaud has been using for over two years in the treatment of pneumonia a simultaneous injection of epinephrin and antipneumococcus serum. Two years ago he reported a series of 27 cases without a death, and he now adds 17 more to the list. During the period in question he has had over 630 cases of pneumonia. This combined treatment brings on the crisis which normally terminates the disease. This explains the regular efficacy of this protein therapy in pneumonia, while its action is uncertain in other diseases which are not characterized by a terminal crisis like pneumonia.

The Adjuvant Causes of Malaria.—Regnault lists among these causes, overcrowding both in the houses and the crowding together of houses, and the scarcity or lack of domestic animals to attract the mosquitoes away from human beings, but chief of all causes is ignorance leading to disregard of the simple hygienic measures required to protect against malaria. Children must be trained in them in school, he says, and also the sick temporarily in the hospitals.

Journal de Médecine de Bordeaux

June 25, 1921, **92**, No. 12

Chemical Composition of Amniotic Fluid. Labat and Favreau.—p. 341.
*Index for Infant Feeding. J. Peyrot.—p. 342.
The Campaign Against Tuberculosis. E. Leuret.—p. 345.

Index for Infant Feeding.—Peyrot adds one tenth of the weight to the height and the chest measure, all in decimal figures. This gives average figures of 406, 467, 542, 617, 690, 806, 851, 893 and 930 for the first nine months of life. These figures are midway between those proposed by various pediatricians as guides in infant feeding. Fifty-three infants given grams of milk according to the above index all thrived well, doubling their weight at the fifth month and tripling it at the twelfth.

Presse Médicale, Paris

June 25, 1921, **29**, No. 51

*Mechanism of Pulsating Pleurisy. L. Bard.—p. 501.
*Paroxysm of Intense Uremia. H. Chabanier, R. Marquezy and A. de Castro Galhardo.—p. 503.
*To Ward Off Accidents in Arsphenamin Treatment. L. Cheinisse.—p. 506.

Pulsating Empyema.—The necropsy findings in the case described by Bard explain the mechanism of such a condition.

Wave of Intense Uremia.—Chabanier explains that the nitrogen content of the blood may increase to a notable extent for a longer or shorter period owing to overproduction of urea, because the kidneys are not secreting enough water, or nephritis may be responsible for the oliguria. Derangement in metabolism of proteins, increasing the amount of urea in the blood, may be secondary to the uremia from other cause. The residual nitrogen figure is an index of the extent of this derangement, whatever the urea content of the blood. But this index is only significant day by day; no ultimate prognosis can be based on it. Hyperazotemia from oliguria of renal origin is combated by promoting the output of water; heart tonics are required when the oliguria is of cardiac origin, but in both these, as well as in hyperazotemia from deranged metabolism, intravenous injection of hypertonic glucose solution seems to act on all the factors of the hyperazotemia at once. In fifteen cases thus treated, the residual nitrogen as well as the urea content subsided. It was supplemented in some cases by subcutaneous and intrarectal injection of the same. The intravenous infusion exceptionally induced a pronounced reaction, with a chill, but it was always transient. Chabanier has encountered cases in which the residual nitrogen content was abnormally high in simple uremia, while in cases of nephritis without uremia it was within normal range. This and other facts cited seem to confirm that the symptoms in uremia are due to derangement

in the metabolism of protein substances; the intensity and the nature of this derangement vary from case to case.

Prophylaxis of Shock on Injection of Arsphenamin.—Cheinisse remarks that the phenomena sometimes observed after injection of arsphenamin and after parenteral injection of foreign proteins, etc., are all of the nature of an anaphylactic shock. This conception has been fruitful in practical results, especially in teaching how to ward off the phenomena indicating intolerance for the arsenicals. These phenomena seem to be the manifestation of an upset in the colloidal balance in the blood serum, with resulting flocculation. Various measures have been tried to ward off this flocculation. The most successful and harmless to date, he says, is Sicard's preliminary injection of 30 c.c. of physiologic saline containing 0.6 or 0.75 gm. of sodium carbonate. The arsenical is injected at once afterward through the same needle. Even after an arsphenamin shock has developed, an immediate injection of 10 c.c. of a 10 per cent. solution of the sodium carbonate may abort it. Kopaczewski has found that addition of three or four drops of ether to the arsenical seemed to ward off all acute arsphenamin reactions in 27 patients thus treated. In 16 other patients, the same effect was realized by dissolving the arsenical in a 20 per cent. solution of saccharose, but a slight chill followed in one case. In 60 other patients he injected 3 c.c. of ether subcutaneously ten minutes before the arsenical, or 5 c.c. of camphorated oil half an hour before it. In 4 of this group there was a slight acute reaction.

Progrès Médical, Paris

May 21, 1921, **36**, No. 21 and Supplement

*Tuberculous Infiltration of Lung. G. Caussade and E. Doumer.—p. 225.
Chemical Changes in Vagus During Digestion. M. Loeper, et al.—p. 227.
Treatment of Tuberculous Adenitis. A. Broca.—p. 227.
Hexamethylenamin in Therapeutics. F. Helme.—p. 237.
*Pregnancy Pyelonephritis. C. Achard.—p. 241.
*The Anemia with Gastric Cancer. Loeper et al.—p. 244.
The Seventh Cervical Rib. G. Bréchot.—p. 246.

Tuberculous Edematous Infiltration of Lung.—Caussade and Doumer describe a form of lobar bronchopneumonia developing in the tuberculous, with pulmonary edema as the first manifestation. In a case described, the man of 59 died the fifty-second day. There were no signs of softening at any time.

Pregnancy Pyelonephritis.—Achard recalls that this develops usually in the second half of the pregnancy. The pain in the kidney is explained by pus in the urine as the general symptoms grow less pronounced. The right kidney is the one generally involved. As the colon bacillus is usually responsible, the digestive tract must be purged and disinfected by restriction to milk. Under this and repose the clinical picture generally subsides. In the grave cases it may be necessary to empty the uterus, but this is exceptional. Nephrostomy can be considered in intense and rebellious cases. The fever usually drops after the pelvis is rinsed out with a 1 per thousand solution of silver nitrate. To rouse the pelvis to contract, Pasteau advises to distend the bladder by injecting some disinfectant until there is a violent desire to urinate. Surgical treatment is required only when the persistence of general symptoms indicates retention of septic urine in the pelvis. Fluids should be supplied in abundance, especially a glass or two of mineral water on rising. The patient must be kept under supervision during the rest of the pregnancy and for a time afterward, as relapses are common.

Anemia With Gastric Cancer.—Anemia is not a constant symptom of gastric cancer, but when it occurs it may dominate the clinical picture. Its hemolytic origin is now almost beyond question. Loeper isolated the albumins in the blood serum and redissolved them in physiologic saline. The solutions thus obtained displayed no hemolytic action, but hemolysis occurred promptly on addition of a few drops of a 5 per cent. suspension of lecithin. This experience is like the cobra venom test. The combination of protein and lecithin is hemolytic in malignant disease. His research demonstrated further that cholesterin protects against hemolysis. In four cancer anemia cases the cholesterin content was unusually low. This suggests the advisability of supplying cholesterin to combat the hemolysis responsible for the anemia.

Schweizerische medizinische Wochenschrift, Basel

June 23, 1921, **51**, No. 25

*Gastric and Duodenal Ulcers. F. de Quervain.—p. 573.
*Artificial Pneumothorax. M. Roch and C. Saloz.—p. 576.
The Ion Balance in the Organism. K. Spiro.—p. 580.
Digitalis by the Vein. P. Wolfer.—p. 587.

End Results of Surgical Treatment of Gastric and Duodenal Ulcers.—De Quervain has had all his patients of this class during the years since 1910 repeatedly reexamined to compare the outcome with conservative and operative treatment, and with various technics. He discusses on the basis of these 247 cases whether and when to operate for gastric or duodenal ulcer. In fully 70 per cent. of his operative cases, the ulcers were of many years' standing, rebellious to conservative measures. The hydrochloric acid after a test meal increased in some cancer cases and not in some simple ulcer cases, so that this has no differential import. Lactic acid was never found in a nonmalignant case. Occult blood was evident in the stools in nearly all the cancer cases, but only in 50 per cent. of the gastric ulcers and 65 per cent. of the duodenal ulcer cases. An indented outline was found almost indiscriminately with various lesions and with normal stomachs. The gastric ulcer was located with precision in only 87 per cent. In 72 per cent. of 100 ulcers of the lesser curvature, a "niche" was distinct; and in 50 per cent. of the ulcers remote from the pylorus the stomach still contained some food six hours after the meal. A "niche" was evident in only 4 of the 58 duodenal ulcer cases and a local diagnosis was possible in only 54 per cent. In 6 per cent. of the total cases, the microscope was required to differentiate the lesion. After gastro-enterostomy, 80 per cent. were cured for four years but later than this the proportion was reduced to 75 per cent. The more radical operations gave a similar figure of 80 per cent. cured.

Perforation of Lung During Artificial Pneumothorax.—The cheesy-fibrous tuberculous process in the right apex of the woman of 27 was being treated by induced pneumothorax. From 600 to 700 c.c. of nitrogen were injected, stopping the injection each time when the pressure reached plus I. At the twelfth injection, when only 300 c.c. had been injected, acute empyema developed, probably from some tear in the lung acting like a valve closed on the side of the pleura. This forbade thoracotomy, and treatment was restricted to evacuation of pus and injection of nitrogen as required. The pyopneumothorax healed in four months, but the valve action was finally lost and the patient died two years after the pneumothorax had been begun under apparently favorable auspices, although the compression of the apex had never been quite complete.

Policlinico, Rome

June 15, 1921, **28**, Surgical Section No. 6

*Repair of Injury of Joint Cartilages. F. Ciociola.—p. 229.
*Treatment of Tumors of Urethra and Bladder. E. Pellecchia.—p. 240.
*Partial Resection of the Kidney. G. Berti.—p. 261. Cont'd.

Repair of Wounds of Cartilage in Joints.—Ciociola reports eleven experiments on dogs for research on the healing processes after injury of articular cartilages.

High Frequency Current in Treatment of Bladder and Urethra Tumors.—Pellecchia gives the details of nine cases out of a much larger experience with the high frequency spark. The results were most gratifying, and the technic simple and convenient both for patient and surgeon. He prefers to combine resection with the electric treatment in malignant disease.

Partial Resection of the Kidney.—As the reports and conclusions of different surgeons have been so contradictory in respect to the effect of partial resection of the kidneys, Berti has undertaken a series of experiments on rabbits to determine the question for himself whether there is hypertrophy and increased functioning of the remaining portion of the kidney. The article is to be continued.

June 1, 1921, **28**, Medical Section No. 6

*Trophic Disturbance of Fingers from Freezing. F. Sabatucci.—p. 233.
*The Radius Extensor Reflex. C. Pastine.—p. 239.
*Lesions of Optic Thalamus. G. Malan and A. Civalleri.—p. 242.
Mechanics of Skull as Affecting Brain. Pedrazzini.—p. 250. Cont'n.

Drumstick Fingers from Freezing.—Three years after the hands had been frozen there were still signs of vasomotor disturbances in the hands, and the drumstick deformity of the fingers which had developed after the injury showed no signs of retrogression.

The Radius Extensor Reflex.—Anything affecting the seventh cervical root is liable to modify the response that normally follows tapping on the styloid process of the radius or on the lower end of the outer margin of the radius. Pastine describes the significance of the findings.

Lesions of the Optic Thalamus.—The only pathologic findings were in the optic thalamus in the case described, in which preparalytic hemichorea had developed suddenly in a coachman of 52, addicted to alcohol.

Riforma Medica, Naples

June 18, 1921, **37**, No. 25

*Nephrectomy for Polycystic Kidney. I. Tansini.—p. 577.
*Nystagmus from Protein Intoxication. F. Pentimalli.—p. 578.
*Wiring for Pseudarthrosis of the Humerus. G. Marsiglia.—p. 580.
*Autoplastic Closure of Gap in Skull. C. Righetti.—p. 582.
*Hypernephroma. R. Mosti.—p. 584.
Operative Treatment of Purulent Pleurisy. E. Aievoli.—p. 586.

Polycystic Kidney.—There has been no recurrence of disturbances in Tansini's case to date, two years since the removal of the left kidney, three years after pain and other symptoms had first attracted attention to it. The urine was comparatively normal, and the other kidney seems to have escaped the tendency to polycystic degeneration.

Nystagmus in Anaphylaxis.—Pentimalli has encountered nystagmus quite frequently as a manifestation of anaphylaxis in man and in animals. It may be the only symptom of the protein poisoning, or it may accompany convulsions, dyspnea or other features of the anaphylactic shock. One rabbit being treated with parenteral injections of milk presented the nystagmus regularly, and he theorizes to explain this, and also the arrest of the nystagmus and of the other manifestations of anaphylaxis under ether anesthesia.

Mechanical Treatment of Pseudarthrosis of the Humerus.—Marsiglia tied two wires, 1 or 2 mm. thick, around the bone, or fastened the stumps firmly together with wire in three cases described. The outcome of this wire osteosynthesis is perfect, he says, surpassing the results with metal plates, etc. Immobilization is imperative from the first. The wire can be buried with simple fracture, but it is better to remove it when there has been suppuration.

Autoplasty of the Skull.—Righetti's method of closing a gap in the skull is by slitting the bone nearby and turning back over the gap the pedunculated thin sheet of bone and periosteum thus pried up. He introduced this method in 1909, and it found wide application on the war wounded, but it is generally regarded as impracticable for children and for the elderly on account of the small size or brittleness of the skull bones at these ages. To correct this impression, Righetti here describes five cases at the extremes of life, three children between 8 and 11 and two men in the sixties, with perfect results in all. This practical demonstration answers all theoretical objections.

Hypernephroma.—In the case described, pain and the palpation of a tumor were the only symptoms from the large hypernephroma in the man of 63, with an over thirty years' course.

Brazil Medico, Rio de Janeiro

May 28, 1921, **35**, No. 22

*Suspension Laryngoscopy. F. Castilho Marcondes.—p. 271.

Direct Suspension Laryngoscopy.—Castilho is assistant professor of otorhinolaryngology, and he here gives a profusely illustrated description of Killian's method of laryngoscopy with the head hanging below the level of the shoulders. He also describes some clinical cases to show the working of the technic and the fine results realized with it in the clinic.

Gaceta Médica de Caracas, Venezuela

March 31, 1921, **28**, No. 6

Tuberculin Treatment of Tuberculosis. E. Meier Flegel.—p. 69.
Plague in Paris in 1920. J. R. Risquez.—p. 72.

Semana Médica, Buenos Aires

May 26, 1921, **28**, No. 21

Tribute to Morquio. G. Aráoz Alfaro et al.—p. 597.
*Treatment of Urine Fistulas. J. Salleras Pagés.—p. 602.
*Importance of the Anamnesis. J. B. de Quirós.—p. 611.
Double Bovine Monster. M. Falsia and H. Aprile.—p. 613.
Calculus in Wharton's Duct. P. V. Cernadas.—p. 617

Treatment of Fistulas by Inversion of Skin.—Salleras' illustrations apply particularly to a fistula into the male urethra, as he applied the technic he describes in four cases of urine fistula opening into the urethra. This is Cathelin's method, he says, and commends it as applicable to fistulas elsewhere. A large catheter is inserted in the urethra and the skin is incised from 3 to 5 mm. from the outer edge of the fistula. This skin flap is then dissected loose, working from the periphery inward and downward to form a kind of funnel, reaching down nearly to the mucosa. The circular skin flap is then slit at top and bottom. Each of the two flaps thus formed is rolled up on itself, the raw side out. These two straight rolls are then sutured together and the skin is sutured over them, first a lengthwise and then a third, transverse incision. The urethra has to be supervised afterward to ward off stricture; in one of his cases the lumen has grown smaller, and now requires dilatation.

The Anamnesis.—In one of the instances related, De Quirós was puzzled to explain the case of a child brought to the hospital in coma, with signs of severe bronchitis. By insistent questioning he finally discovered a fact to which the parents had paid no attention, namely, that the child had access to a bottle of alcohol which was found empty.

Siglo Médico, Madrid

June 11, 1921, **68**, No. 3522

*Intravenous Treatment of Syphilis. E. Alvarez Sáinz de Aja.—p. 549.
Grave Complications of Otitis Media. I. Fernández Seco.—p. 552.
Indications for Deep Radiotherapy. J. Ratera.—p. 557. Cont'd.

Intravenous Treatment of Syphilis.—Alvarez discusses the signs of a correctly made puncture of a vein, the symptoms from intolerance of mercury, and the rarer accidents liable to be encountered. He protests further against the abuse of injections by the vein, continuing the course to excess.

Archiv für Kinderheilkunde, Stuttgart

June 21, 1921, **69**, No. 6

*Congenital Syphilis. R. Fischl and E. Steinert.—p. 399.
*Prevention of Tuberculosis Infection in Hospitals. K. Peyrer.—p. 419.
Spasmophilia and Induced Muscle Contraction. A. Eckstein.—p. 426.
*Fats in Infant Feeding. F. K. Noack.—p. 431.
*Creatin and Creatinin in Infants. E. Schiff and A. Bálint.—p. 439.
*Edema and Intestinal Tuberculosis. A. Wiechers.—p. 450.
*Local Conditions Influencing Tuberculin Tests. L. Salmony.—p. 454.
*Abdominal Pain in Children. A. Peiper.—p. 462. Conc'n.

Problems of Congenital Syphilis.—Fischl and Steinert relate that ever since May, 1912, all the mothers and children in the children's clinic at Prague have had the Wassermann test systematically applied every month. The data thus obtained confirm the placental transmission of syphilis, and also, most unexpectedly, confirm Profeta's law to the extent that 17 apparently healthy infants failed to show any signs of syphilis although their mothers were in the most contagious phase of florid syphilis. Ten of the infants in this group never responded positively to the Wassermann test, applied from six to twelve times. Five of the mothers in this group were also constantly negative, notwithstanding their florid papules at the anus, etc. Immunization by way of the placenta before birth and by suckling afterwards will have to be accepted in these cases, they assert, even allowing for the defective production—common to all the new-born—of the substances yielding the Wassermann reaction They tabulate several cases of infants with pronounced lesions swarming with spirochetes but with a constantly or frequently negative Wassermann reaction. Treatment with arsphenamin did not display any provocative action in this respect. Chronic jaundice in early infancy is suspicious of syphilis, even with negative serologic tests. In 34 infants the manifestations of the inherited syphilis developed late, and the Wassermann reaction did not become positive until some time later, but in 11.7 per cent. the Wassermann veered to positive as the precursor of the clinical manifestations. In 2 cases the Wassermann became negative after the tardy

eruption had developed. In apparently healthy infants a supposedly harmless staphylococcus skin lesion may often shelter spirochetes and spread them broadcast. In several such cases, nothing but a positive Wassermann in the mother suggested looking for spirochetes in the vesicle fluid.

Hospital Contagion with Tuberculosis.—Peyrer reports that the experiences at the children's clinic at Graz in this line prove that contagion does not occur if the tuberculin negative children are kept apart from the coughing tuberculous cases. When the children are in bed all the time a glass partition is sufficient protection.

Metabolic Findings in Infants on Butter-Flour Mixture and Cream-Milk.—Noack's findings speak decidedly in favor of fat in infant feeding.

Creatin Output in Infants.—Schiff and Bálint determined the amount of creatin and of creatinin eliminated by seven infants from 2 to 7 months old. The smallest output of creatinin was in an infant with doughy hypotonic rachitis; the largest, in an idiot infant with unusually well developed muscles. The only infant with no creatin in the urine was breast fed with well developed muscles and tendency to hypertony. The creatinin output was 111 mg. in this case. In the others it ranged from 42.75 to 127.6 mg. The creatin output in these extreme cases was 3.8 and 31.1 mg.; the weight 3,200 and 5,150 gm.

Famine Edema and Intestinal Tuberculosis.—The child of nearly 6 had presented for several weeks the picture of famine edema although the food had always been ample. Severe diarrhea suggested that the edema might be a sequel of chronic dysentery that had escaped detection. Necropsy corrected the diagnosis to chronic intestinal tuberculosis. This had evidently prevented absorption of nourishment from the bowel, and the diffuse edema followed, the same as in the starving. Wiechers has been unable to find any case of the kind on record.

Modification of the Skin Tuberculin Test.—Salmony has noticed great variations in the response to the Pirquet test according as the blood was circulating slow or fast through the region of the test. The most pronounced response to the test was obtained when the local circulation was arrested. The skin in certain regions is also prompter in responding. She never was able to reverse the findings of the test by measures along these lines.

Abdominal Pain in Children.—Peiper here concludes a general survey of this subject. His conclusion is that as abdominal pain in children often accompanies remote organic disturbances and often occurs without organic lesions anywhere, it is imperative to examine the whole child and not merely the abdomen alone.

Archiv für klinische Chirurgie, Berlin

May 24, 1921, **115**, No. 4

Retroperitoneal Lipomas. A. L. von Wahlendorf.—p. 751.
Regeneration of Tendons. A. Salomon.—p. 769.
*Occult Blood in Diagnosis of Gastric Ulcer. K. Lutz.—p. 780.
*Local Anesthesia Between Two Tourniquets. R. Sievers.—p. 796.
*Thrombosis of Abdominal Aorta. E. Hesse.—p. 812.
Surgical Tuberculosis, Wieting.—p. 868.
Foreign Bodies in Esophagus. R. Vogel.—p. 910.
Changes in Shape of Trachea. M. Sgalitzer.—p. 967.
Progressive Pulmonary Tuberculosis After Goiter Operations. A. Clairmont and E. Suchanek.—p. 995.
Regeneration of Gallbladder After Cholecystectomy. Walzel.—p. 1000.

Occult Bleeding in Diagnosis of Gastric Ulcer.—Lutz' extensive experience and research confirm that occult blood is the most reliable sign at our disposal for detecting ulceration in the stomach. The gradual disappearance under treatment of the blood from the stools till it vanishes completely testifies to the nonmalignant character of the lesion, as also the alternation of positive and negative findings. Positive responses in the stool and never in the stomach content, locates the ulcer below the pylorus.

Transverse Section Anesthesia.—Sievers' further experience has brilliantly confirmed, he says, the efficacy and harmlessness of anesthetizing a limb by infiltrating a circular band of tissues with 1 per cent. solution of procain between two constricting bands. He calls this *querschnittsanästhesie*, and declares that it is adapted for all operations on limbs that require something more than simple ordinary infiltration anesthesia. The aim is to anesthetize the entire incarcerated segment, and it requires a few whiffs of ether in addition for children. It is particularly easy and convenient for children.

Thrombosis of Abdominal Aorta.—Hesse summarizes 73 cases of thrombosis and embolism of the abdominal aorta on record. Nearly 95 per cent. died under expectant treatment, but in 10 cases an attempt was made to remove the obstruction. It was successful in 50 per cent. and in some of the others came too late, as the limb was already dead. Embolism of the aorta is more common than thrombosis. It is usually secondary to endocarditis, principally mitral stenosis. The symptoms are in the legs at first, as the circulation is shut off. If there is no pain in the abdomen, no bladder symptoms, the embolus is probably at the bifurcation. In over half the cases the embolus projected into the iliac artery. Transperitoneal aortomy with extraction of the embolus is advisable in recent cases, but with thrombosis, high amputation of the thigh is the only resort; ligation of the vein cannot be recommended. If the blood stream becomes obstructed again after the embolus has been removed, he advocates high amputation of both thighs.

Deutsche medizinische Wochenschrift, Berlin

June 16, 1921, **47**, No. 24

Errors in Diagnosis of Back Pains. R. T. von Jaschke.—p. 669.
Transmission of Foot-and-Mouth Disease to Guinea-Pigs. P. Uhlenhuth.—p. 671.
Revaccination and Its Problems. G. Sobernheim.—p. 672.
Methods with Simplified Indicators. L. Michaelis.—p. 673.
Late Sequels of Epidemic Encephalitis. H. Grage.—p. 673.
Apparatus for Sitting and Reclining During Extension of Spine. E. Brunthaler.—p. 674.
Prophylactic Use of Quartz Lamp in Rachitis. E. Mengert.—p. 675.
Icterus Following Arsphenamin Administration. P. Tachau.—p. 677. Conc'n in No. 25.
Observations on Capillaries of the Skin in Connection with Syphilitic Exanthems. W. Krantz.—p. 679.
Decrease of Tuberculosis in Germany. A. Wolff-Eisner.—p. 681. Comment. B. Möllers.—p. 681.
*Mechanism of Inheritance of Sex. T. Péterfi.—p. 682. Conc'n.
Causes and Treatment of Foot Affections. F. Loeffler.—p. 684.
Treatment of Tuberculous Skin Ulcer with Celluloid Plate. H. Deutsch.—p. 686.

Mechanism of Inheritance of Sex.—Péterfi presents evidence that the chromosome which has no mate to pair with it is the morphologic element bearing the sex factors, although it is not the sex determining factor.

Wiener klinische Wochenschrift, Vienna

June 16, 1921, **34**, No. 24

A Practical Iodin Solution. F. Pregl.—p. 288.
Pathology of Pulmonary Vessels. J. Wiesel and R. Löwy.—p. 289.
Cardiospasm. J. Pal.—p. 290.
*Status Thymicolymphaticus. C. Sternberg.—p. 291.
Anatomic Basis of Findings in Spinal Fluid in the Early Stage of Syphilis. H. Königstein and E. A. Spiegel.—p. 292.
Diagnosis of Sciatica. F. Deutsch.—p. 293.

Status Thymicolymphaticus.—Sternberg, in discussing the various aspects of this condition, refers to the anatomicopathologic experiences of the World War, which bear on the subject. Several writers report that frequently in necropsies on the bodies of soldiers they found a lymphatic state. Borst and Groll, on the basis of 2,000 necropsies, report that a lymphoid hyperplasia existed in 56 per cent. of all soldiers, and in those 19 and 20 years of age, 86 per cent. Sternberg thinks that this finding must be interpreted as meaning that in young persons the lymph glands normally are extremely well developed, and that in such cases hitherto a lymphatic state was assumed simply because the normal condition was not understood. The lymphatic tissue retrogresses evidently with advancing years, especially under the influence of disease, nutritional disturbances, etc. On necropsy, we find therefore the lymph glands of persons who die in the hospitals, as a rule, small, and we thus arrive at a false conception of the normal condition. In the light of the investigations of Borst and Groll, a thorough revision of our conceptions of lymphatism or the lymphatic constitution seems imperative. However, it would seem true that in certain individuals, even in advanced years and in spite of various diseases passed through, an abnormally large thymus and

an unusual amount of lymphoid tissue are sometimes present; furthermore, that in such cases we find, at the same time, other anomalies; particularly hypoplasia of the vascular system. In such cases, so far as we know as yet, there seems to be a constitutional anomaly, and we are doubtless justified in speaking of a status thymicolymphaticus. But such cases are certainly rare and have nothing to do with what is commonly and loosely termed lymphatism.

Zentralblatt für Chirurgie, Leipzig

June 18, 1921, **48**, No. 24

Successful Resection of Esophagus Through the Neck for Carcinoma. H. Küttner.—p. 846.
*Stomach Resection by Billroth I Method. H. Haberer.—p. 847.
Abdominal Closure After Cholecystectomy. F. Franke.—p. 856.
Arteriomesenteric Duodenal Occlusion. E. Goldberg.—p. 857.

Further Extension of the Principle of the Billroth I Method in Resection of the Stomach.—Since Haberer reported last year 55 cases in which he had performed stomach resection by the Billroth I method he has operated in 165 other cases, partly for duodenal ulcer and partly in ulcerations of the stomach. In 8 of the 220 cases the patients died after the operation, a mortality of over 3 per cent. Two of the 8 fatal cases are chargeable to the technic, the result of dehiscence of the sutures. One patient died ten hours after the operation, of severe cachexia; 5 patients from lung complications occurring up to twenty-two days after the operation, but in all 5 cases the peritoneum was smooth and glistening; the anastomosis suture had healed, and the anastomosis itself was permeable. Haberer is well satisfied with the results in the remaining 212 cases although it is too early to estimate the permanent results. During the period that he operated on the 165 cases by the Billroth I method, he used the Billroth II method in 10 cases, all of which resulted in recovery. He gives illustrations of an extreme case in which the Billroth I principle was applied to total gastrectomy and with complete success.

Zentralblatt für innere Medizin, Leipzig

May 28, 1921, **42**, No. 21

*Daily Variations of High Blood Pressure. E. Kylin.—p. 417.

Daily Variations of Arterial Tension in High Blood Pressure.—Kylin opposes Volhard's recent declarations in regard to the etiology of high blood pressure. Volhard holds that high blood pressure is caused by a contraction throughout the whole vascular system; in some cases including the most minute capillaries. This contraction is said to be produced reflexly, possibly by way of the suprarenals. The original cause must be an injury to the kidneys. Kylin argues that if kidney injuries are the cause of high blood pressure then kidney symptoms must necessarily appear before increased blood pressure. He gives records of cases to show that such is not the case. Then, again, the kidney injuries in general would be in direct relation to the increase in blood pressure. The greater the damage, the higher the blood pressure would be. As for such a direct relationship, Kylin's investigations lead him to deny that it exists, and he declares that in our present state of knowledge of the pathology of the kidneys and their function we must admit that it is impossible to regard high blood pressure as the result of kidney injuries. On the contrary, he thinks that everything indicates that the primary condition in so-called diffuse glomerulonephritis is a diffuse damaging of the capillary system probably caused by poisonous substances acting directly on the capillaries, such poisons having been produced during the course of acute infectious diseases and taken over into the bloodstream. He finds that with this theory as a basis all such pathologic manifestations can be consistently explained.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

May 28, 1921, **1**, No. 22

*Practitioners' Blunders in Treating the Eye. W. P. C. Zeeman.—p. 2908.
*Temporary Sterilization of Women. T. H. van de Velde.—p. 2920.
Course of Typhoid in the Vaccinated. P. H. Kramer.—p. 2927.
Physicotherapy in Infantile Paralysis. J. van Breemen.—p. 2936.
Amebic Liver Abscess. J. van der Hoeven.—p. 2940.
Abscess from Ascarids. O. Lanz.—p. 2943.

Blunders in Treatment of the Eyes.—Zeeman describes among others a case in which a nevus in the iris was mistaken for a foreign body by the general practitioner, the actual foreign body having escaped in the interim. He cites a number of instances in which a foreign body had long been overlooked while the eye was being treated on a mistaken diagnosis. In one case the pain and swelling from a blow on the edge of the orbit were assumed to be the result of a fracture in the depths, but the grave prognosis was disproved by return of normal conditions. Blunders in other cases were in ophthalmia neonatorum. This still occurs, notwithstanding the great progress in this line. His figures show a drop from twenty-seven cases in 1899-1901 to seven in 1917-1919. Other blunders were the nonrecognition in infants of a tendency to buphthalmos, months being allowed to elapse with merely plain boric acid treatment, and the nonrecognition of stenosis of the lacrimal passages, which should have suggested tentative treatment for syphilis. In one infant, edema and bluish discoloration of the eyelids proved to be due to scurvy with subperiosteal hemorrhage in the orbit. The family physician was called to one infant on account of a stye; he reassured the parents, but the lesion worked backward into the depths with fatal outcome. An incision in time might have warded this off. Chronic glaucoma comparatively frequently fails to get the proper treatment; in one case a nose specialist was consulted, as a friend's vision had improved after her nose had been treated, and the nose treatment was continued twice a week for a year. Fortunately it proved possible even then for the ophthalmologist to save partial vision. Another person complained of stomach disturbance and was treated for dyspepsia for six months, when eye symptoms sent him to an ophthalmologist who found severe albuminuric retinitis. Zeeman doubts whether the stomach had been at fault at any time. Some other cases cited illustrate the folly of treating eye disease without the internist seeking for and removing the primary cause; in one case this was cardiorenal disease, in another a tuberculous iridocyclitis. He comments that the general practitioner is not to blame if his training had neglected to teach him the possibility of such mistakes.

Temporary Sterilization.—Van de Velde expatiates on the advantages of a means of preventing conception which can be remedied at any time when the need for it is past. The method he has found simple, harmless and effectual is to shift the ovaries forward, burying them in the peritoneum. The ovaries are completely isolated from the rest of the genitals, walled in by peritoneum on all sides. Each ovary is drawn through a slit in the broad ligament into the fold of the peritoneum between the bladder and uterus, and this fold is sutured together above to make a closed sac. He has performed this operation in nine cases since 1908, and always with complete satisfaction and no by-effects or disturbances of any kind at the time or later. In one case he had occasion to restore the ovaries to their normal place three years later. They seemed normal in every respect, and there were no adhesions. The woman has had two normal pregnancies since.

Hospitalstidende, Copenhagen

June 15, 1921, **64**, N. 24

*Polycythemia. F. Rydgaard.—p. 379. Conc'n No. 25, p. 385.

June 22, 1921, **64**, No. 25

Treatment of Gonorrheal Urethritis. H. Haxthausen.—p. 394. Conc'n No. 26.

Radiotherapy in Polycythemia with Enlargement of Spleen.—Rydgaard relates that the clinical picture of Vaquez' disease retrogressed completely after roentgen exposures of the woman's enormously large spleen. The cure has been permanent during the eighteen months to date. The first symptoms had been of a vasomotor nature, chilliness and anesthesia in the legs, about a year before. Erythromelalgia ushered in the clinical picture in six cases on record, like the vasomotor disturbances in this case. The literature contains a number of similarly successful cases from raying of the spleen or bone marrow, or both, but there are also a number of failures recorded.